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SUNRISE AT THE SPRINGS

air force

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quarterly

AFRP 85-1 VOL 23 NO 2 SUMMER 1982

From the Director

I am honored to become the fourteenth Director of Air Force Engineering and Services. I suspect my initial emotions are not unlike those of my predecessors as they assume this office...each new Director is tempted to reflect a bit on where we've been and then with a mixture of anticipation and perhaps awe, to chart a course for the future.

Those of you who have been in Civil Engineering or Services for more than a few years must share my extraordinary sense of pride in our two professions. It is hard to imagine any other career fields which have shared the degree of "growth" we have seen; growth not in terms of numbers of people but in terms of quality of people, quality of product, and recognition and prestige within the Air Force. The work we do is not always glamorous but no one disputes its importance. Our people do not always get the recognition they deserve but no one disputes their professionalism and dedication, and recognition is on the upswing as senior leaders become increasingly aware of the importance of our role in all aspects of mission accomplishment and day-to-day functioning of our bases.

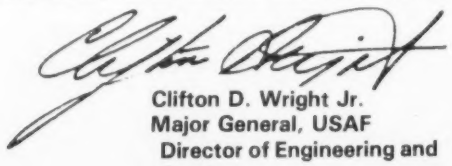
Our course for the future must simply be to continue to grow, again not in quantity but in quality. Since base level activities are where we ultimately make or break our mark, it is at base level that we must ensure our people have the resources; employ the most efficient management techniques; and are trained and motivated to do their jobs. We in the Pentagon will do all we can to satisfy your requirements in these areas and to help you meet the challenges you face in the field.

No element of base level activity is more important than being prepared to shift into a wartime mode. We must never forget why we wear the uniform. That blue suit speaks to a commitment on the part of the individual who wears it, and it is up to leaders and managers at all levels to help keep that commitment fresh in everyone's mind. We must also ensure that training, equipment and motivation are sufficient to satisfy our wartime mission.

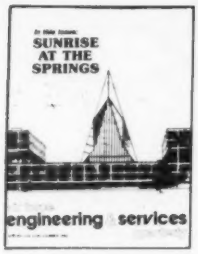
We will, on a priority basis, continue to work the problems of design and construction management, energy, research and development, and environmental and safety related issues. In each area we will look to the best people in our profession to solve the complex challenges which seem to compound daily as technology advances and new demands are made on our people and facilities. We must stress good design - esthetically and technically - and better construction and program management. This begins with the smallest project at the base and carries through to our largest projects at the national level. We will continue to improve food service, dormitory and billeting management, and the other essential functions in the Services arena.

Over the next few months we will delve more deeply into these and other areas of Engineering and Services concern and try to develop workable programs to keep us ahead of the power curve in terms of meeting the tough challenges on the horizon. I will work closely with the major command Engineering and Services leaders to be sure we are looking in the right direction. I trust they, in turn, will tap the ideas and innovations offered by those of you at base level and in staff jobs.

The next few years will be filled with excitement and challenge. I look forward to working with everyone at all levels of the Engineering and Services family to make them successful years for the Air Force.



Clifton D. Wright Jr.
Major General, USAF
Director of Engineering and Services



Teamwork and dedication are essential as we work and program for a new and renewed Air Force.

engineering & services

Air Force
Engineering and Services
Quarterly

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Maj. Gen. Clifton D. Wright Jr.
Director
Engineering and Services
HQ USAF

Col. Ernest D. Strait
Commander
Engineering & Services
Center
Tyndall AFB, Florida

EDITORIAL STAFF
H. Perry Sullivan
Editor

Sgt. Lea G. Blake
Associate Editor

Dean M. Spencer
Production/Art Editor

CALL OR WRITE
The Editor
HQ AFESC/DEJ
Tyndall AFB FL 32403
AUTOVON 970-6467

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Cover Illustration — Dean Spencer

MUST...a plan for renewal

By Lt. Jerry P. Haenisch

The time: Now
The place: A national landmark — the site of a vital Air Force mission.
The situation: The facilities and support systems are showing their age. Deterioration is becoming evident; cosmetic repairs and quick fixes are no longer adequate to support the mission. The solution: That is what this story is all about.

First some background considerations.

The national landmark mentioned above is the U.S. Air Force Academy located northwest of Colorado Springs, Colo. Since its completion in 1958, the Academy has been internationally recognized as one of the finest examples of comprehensive design and campus layout in the world. To the 1.5 million visitors who visit each year, the Academy is the showcase of Air Force standards.

CONSIDERATION 1: The grounds and facilities of the Academy must convey to those who visit here the standard of excellence of the U.S. Air Force.

The condition of the facilities also has a major influence upon the men and women who spend four years here preparing themselves for careers as leaders in the Air Force. As new second lieutenants, they take with them to the field perceptions of quality based upon the condition of the Air Force Academy.

CONSIDERATION 2: Future leaders of the Air Force must experience the highest standards of quality if they are to strive toward excellence after they graduate to the field.

The Air Force Academy was designed and built with these two considerations in mind. It is unique in appearance and function. Its problems are not unique. From the day of its construction, the natural process sometimes known as entropy has been at work. Webster defines entropy as "the degradation of the matter and energy in the universe to an ultimate state of inert uniformity." Others simply call it "wear and tear." Whatever it's called, it is the reason why civil engineers do maintenance and repair work.

The Academy civil engineers, 7625th Civil Engineering Squadron, have documented the decay process

The editor interviews Maj. Gen. Robert E. Kelley, superintendent of the U.S. Air Force Academy.

ESQ: The renewal and rework program here at the Air Force Academy is first of all impressive. However, when we look at the Academy's technical history, we see a pattern of progressive repair requirements building up over most of the history of the facility. Is this the first really intensive effort to arrest further deterioration?

GEN. KELLEY: Yes, I believe it is. But this situation is very understandable given Air Force needs and priorities in the last 10-15 years. Complicating our problem was the fact that most people think of the Academy as brand new. But, it isn't. It's more than 25 years old. When you see the Academy, or see pictures of it — usually taken from a distance — it still looks special. But up close there are problems of aging. Another consideration is that the Academy was built almost all at once, as opposed to West Point or Annapolis, both of which evolved over time. The Academy, capable of supporting 2,400 students at its inception, was done in relative terms with the snap of a finger. Money was appropriated and it was built. When it was completed, everyone said, "There's the Air Force Academy. It's a beautiful place, a wonderful facility. We don't have to worry about that anymore." So, in effect, we didn't worry about it for a number of years. Then when our repair and renewal needs became more obvious, we were in the austere fiscal period of the 1970s when defense funding was being reduced. The available money was going to higher priority efforts.

ESQ: What has been the Academy's method of arresting progressive deterioration?

GEN. KELLEY: First, we identified and categorized our requirements, then prioritized them and articulated our needs and the required solutions to the proper people. Now, we're beginning to apply the needed remedies. The first program was called MUST. MUST is the acronymn for Maintenance and Upgrade of Structures for Tommorrow. This program was already underway when I arrived. Col. Ralph Hodge, my civil engineer, had identified some very fundamental problems that had to be corrected and he put the MUST program together. He had been around the Air Force, understood what was going on in the Air Force, and what it took to get things done. When I arrived on the scene, I visited every part of the Academy and it was obvious that the MUST program was needed. In fact, we needed a great deal more. There were indications everywhere that we were not adequately funding maintenance and repair. For example, Vandenberg Hall is our oldest dorm. It had ceilings that were coming down, water from a shower making a puddle in a cadet's room. Rooms had old and repaired furniture — over 65 percent of it was 25 years old. Now, we expect furniture to last between 12 and 15 years. The original buy lasted very well — almost twice as long as one would expect. So, I give the people who did the original buy high marks. As you know, I came here from Nellis Air Force Base in Nevada, part of the Tactical Air Command. After visiting Vandenberg Hall, I told Gen. (Robert D.) Beckel, our Commandant of Cadets at the time, that if General (Wilbur) Creech, the TAC commander, had come through a dorm at Nellis and found these conditions, he would have fired me, and should have. The fact of the matter was that the dorms of the Air Force Academy did not meet the standards of dormitories in which our first term enlisted people were liv-

ing in the Air Force.

ESQ: What was Nellis like when you first went there?

GEN. KELLEY: Well, first in terms of dormitories, we had what I called "a survey of American Air Force dormitories 1940-1980" — one of every kind. Variety and numbers to house were the problem. I'm sure you've heard of General Creech's program called "New Look." Many have heard of the program but not the philosophy behind it. The idea behind "New Look" focused on improving productivity in TAC. General Creech said that "what we're about in TAC is flying airplanes and our primary attention ought to be on the flight line." He often told a story about visiting a TAC base in the southwest. He found an operations building with an air conditioner and a maintenance building right next to it which had a swamp cooler. But, the swamp cooler fan didn't work. Furniture was old and inevitably there was an overstuffed chair with a spring that stuck out of the upholstery. Now you may wonder what this had to do with flying planes. At first, we did too. We were too close to the forest to see the trees. All of our energy was spent turning out airplanes, but if you looked at the flying time schedule from '73 to '78 we just weren't making it. General Creech stated flatly that we were going to turn it around, produce more flying time and he set the goals. Well, all of the commanders agonized over this and said, "We're just holding on by our fingertips now." What General Creech knew was that we had residual capability and we were not working up to our potential. So, in addition to the goals, he said we were going to improve the working conditions for our maintenance people. In his mind there was a direct relationship between the work that people did and the environment in which they lived. And he was right. It took pride. Now I would characterize the working environment that existed as the corner greasemonkey operation as contrasted with an Indianapolis high performance race car operation. That was the beginning of "New Look." The whole idea was to get people involved and to make them understand what our mission was, understand that our product was generating sorties and flying aircraft, and that meant making our people produce. It meant that they were going to have more to do. But, at the same time we said we would help them get better facilities. In a year and a half at Nellis, we went from in-commission rates of about 37 percent to almost 70 percent. And when you walked into the 66th Squadron at Nellis there was a place for everything and everything in its place. We put order, structure and discipline into our flight line environments. We made it a military outfit. In some ways perhaps it was a little overdone. Perhaps it was a little too antiseptic, like the operating room at the hospital. We overshot once we got going, but our people were taking pride in their working place. That's the basic idea: Pride, Professionalism and Discipline. People want to do a good job. If the job takes 13-hours-a-day, you will find people in the Air Force who will do it. They'll put in the time that's required to do the job. The difficult part is the individual who doesn't have a full job. He has to think of things to do. On the TAC flight line there was more than enough for everyone. We insured that we were training our people while we were improving our facilities and improving our productivity. That's the background with which I came to the Academy. I knew it could be done.

ESQ: Do you feel the working and living conditions of the Academy should be comparable to those found in the operating Air Force?

GEN. KELLEY: No. I believe that the standards of the Air Force Academy should be better...higher than the standards of the Air Force. We don't want our graduates to go out and find a new standard. We want them to take the highest standard possible to the Air Force and pull the Air Force up to that standard. That's what this place is all about. In fact our purpose, our standard is encapsulated in our motto, "A commitment to excellence." You see this Academy exists for one reason. It exists because there is a United States Air Force and the most important words in that title are the two words "United States." That's the only reason we have an Air Force — to protect the United States of America. The only reason we have an Air Force Academy is to provide officers and leaders for our Air Force. The two most important words in the title of the Academy are Air Force because those two words give us our purpose — our focus. We want those leaders to go into the Air Force with standards, a vision, energy, enthusiasm and motivation to make the Air Force better, and they find that the Air Force is better. It comes from a meaningful military, academic, athletic, moral and ethical in our technical history. Also well documented are the various methods we've used to slow down or minimize the negative effects of entropy. Fortunately, in the early years, major facility or system problems surfaced individually and could be dealt with one at a time. A big project such as repair of high temperature hot water lines could be accomplished while normal preventive maintenance continued in other areas. As the facilities aged, however, the need for extensive repairs became increasingly widespread. You see, all the buildings were built at the same time; problems that surfaced in one building were soon found in all the others. Piecemeal repair and upgrade became inadequate. Something was missing in the battle against entropy. That something was a long range plan of systematic upgrade that anticipated future requirements.

In 1979, Col. Ralph Hodge, DCS/Civil Engineering, USAFA, instituted such a plan. It wasn't easy. His first action was to bring together his CE team to assess the situation. The Academy still looked as beautiful and elegant as ever, but the beauty was truely only skin deep. Corrosion, decay and structural damage lay hidden beneath the surface. A team of engineers was tasked to look closely at the buildings and systems with a more critical eye than ever before. Their purpose was to identify needed repairs of major scope. The results were impressive.

No aspect of the Academy's physical plant escaped scrutiny. We found that the problems went very deep indeed. From roof leaks to ground erosion, to structural concrete damage, to mechanical system corrosion, to outdated fire alarm systems, to failing roads — the evaluations came in. How could all this decay happen all at once?

It didn't. A pattern had emerged. As the Academy aged, the need for aggressive maintenance and repair increased. At the same time, the availability of resources, both money and manpower, decreased. The result was what we call deferred maintenance. With the capability for thorough preventive maintenance curtailed, minor corrosion and deterioration problems were left untreated. Emergency repairs and catch-up maintenance were the rule of the day. Restricted resources left us in a reactionary mode of operation. Well, we now knew what work was needed and we understood how the situation had

developed over time. What next?

Colonel Hodge recognized that such an enormous task as we were faced with needed a focus. The question was asked, "Why worry now over a situation that has been going on for years?" The answer relates back to entropy. Without an influx of new order, a renewal in effect, the Academy would eventually end up in a state of "inert uniformity." It would soon wear out and become history. The realization emerged that to give the Academy another 25 years of useful life we would have to correct the effects of 25 years of wear and tear. But that would only bring us back to our starting point of 1958. Times have changed. The Air Force is a modern force moving into the space age and the year 2000. The words came to form a handle for our project: upgrade, modernization, structures, tomorrow, maintenance, and repair.

To convey the urgency of the project, the worlds were put in order to form the acronym MUST — Modernization and Upgrade of Structures for Tomorrow. The meaning of the words was clearly spelled out.

MODERNIZATION — Concerns retrofitting facilities to conserve energy and to save on future maintenance and repair costs.

UPGRADE — Means increasing the priority of essential maintenance and repair requirements.

STRUCTURES — Includes utility systems, roads, exposed aggregate, buildings, and mechanical systems.

TOMORROW — This program is designed to carry the Academy into the year 2005 and beyond.

The needs were identified. The plan had a name. Things were underway. The next step was action. This was a crucial point. The Academy did not have a documented Backlog of Maintenance and Repair (BMAR). The facilities looked to be in top shape. Who would believe there was a problem right here on the Air Force Academy? Who did we need to convince that we had a problem? How could we even show that there was a problem? We answered the last question first.

First we wrote down specifically what work was needed. Cost estimates were established and projects were classified by type and priority. This action gave us a package we could talk about; it established the dimensions of the MUST program and quantified its costs. To be convincing, however, thousands of words were needed to describe in detail the whats and wherefores. Pictures were needed to show the problems. Then we had to show how we could solve the problems.

ESQ: Are you working to improve the living standards of the cadets?

GEN. KELLEY: You bet! We have a program called GUIDE — General Upgrade in Dormitory Environment. First we asked, "Where do the cadets do their work?" The work area for the cadet, their duty section, is divided between the classroom and their room. A cadet spends hours and hours studying. If you had to study in a place, an environment that was not conducive to learning, a room that smelled of mildew or with water pooling in the corner, if the light was poor and did not meet the standards, if you didn't have a comfortable chair in which to sit and read, if it was austere and cold, would you want to go back there to study? The environment can inhibit the individual from doing his duty — which is preparing for his life work, his profession. How can we instill pride, professionalism and discipline in such an environment? Some of it is communicated logically through the processes of the mind, stimulated by what we perceive with our eyes and ears. It is also something that you absorb through your pores from the environment. So, we decided to make it better. We set up four dormitory rooms as a test and carefully researched the cadet attitudes and reactions living under this new standard. They love it! We then took the program up the chain of command to the Air Staff, also to our Board of Visitors, which advises the President on the effective and efficient operation of the Academy. The Board asked, "Why can't you do it faster?" The need was recognized and accepted. It's clear we want our graduates from the Air Force Academy to infuse our Air Force with a new life blood — new standards.

ESQ: Do you feel that the evidences of physical deterioration were in fact subconsciously communicating to the the cadets that they were going to have to accept this wherever they go in the Air Force?

GEN. KELLEY: I don't think that there is any question about that. That's why we have made the upgrade into a learning experience. For example, many things that were not fixed or repaired in the dormitories had not been reported. So, what we have done is to make that a part of the responsibilities of the cadet squadron commander. We want him to realize that he must be responsible for taking care of his people. So, when he goes out into the Air Force, and there is a substandard condition, he says, "I know how to fix that. I have to write up a report to the civil engineer. We've got to get money and put together a program, follow up and make sure it gets fixed."

On dormitory inadequacies: "How can we instill pride, professionalism and discipline in such an environment?"

ESQ: So, in fact you are teaching to the cadet a leadership process that calls for someone to interact with the quality of life through maintenance of physical facilities.

GEN. KELLEY: If he's not sensitive to it here, somebody has to make him sensitive to it tomorrow. We want him to be sensitive to it today. We don't want him to think that it is always perfect, and that you walk through life and someone else is going to fix and solve problems for you. We want them to understand that they are the

people who make it happen; that you must make it happen. It doesn't just happen.

ESQ: I'm curious about the metamorphosis of self-image here now that people see the fundamental things being done — they see the deterioration being rectified.

GEN. KELLEY: That's a very perceptive point. Some people, including many who have been here for years, are saying "It's about time." Others see it as a personal indictment. They don't feel that I think they have been doing their job. The attitude I want is that "We really need to do what is needed now." I want the most junior, most inexperienced person in the organization to feel that when things are in disrepair, we've got to fix it. The test of leadership is awareness at the operating level. But the real test of leadership is seeing how the organization runs and operates after you leave. You can pull it in here, push it together, pull it here, push it, shove it, but how does it operate after you leave? Have you instilled in the organization a willingness, a sense of understanding, a sense of responsibility? You know there is one word that I think needs to be emphasized in our country today, in the Air Force and here in the Air Force Academy — that's responsibility. I want every graduate who leaves here to have a real feeling for a sense of responsibility — responsibility with a great big capital R, — a great willingness to accept the consequences of his actions, a confidence that they are able to solve problems.

ESQ: In the 25 years since the Academy was built, it seems that the visible deterioration has been increasing almost annually — concrete spalling, breakup of the marble in the terrazo, and so forth. Is there a reason why?

GEN. KELLEY: Those are just the sort of problems which occur as a result of not having enough money at the right time. You could get the idea that people over the years were not doing anything. They were doing things. And they were doing the right things; things needed to be done at the time. But, just as age began to accelerate the rate of deterioration our manpower was cut. When you look at the manpower authorizations for the civil engineering force 10-15 years ago, you will find we had nearly 900. Now we're cut back to about 600. Unfortunately, this occurred as the requirements for maintenance and repair were going up. As a result, we have to be innovative. We've got to complement our workforce with contracting efforts. But, we want to do it as smart as we can. And I think that comes from thorough, in-depth, detailed planning and programming, and then articulating your needs and getting the kind of support that you require. And we are doing that.

On duty at USAFA: "... there is an expectation, a perception that everything is perfect, like Camelot."

ESQ: The assumptions which went into the Academy construction in the late 1950s have been changed by many different dynamic forces, including the dramatic increase in energy costs. How do you react to the critics who challenge the Academy's design and methods of construction?

GEN. KELLEY: It's very easy to be critical on hindsight. And, I'm not sure that it is very useful. The question I ask myself is, "What are we doing today, or not doing today that will cause people 25 years from now to be and whys of the program. Someone suggested that pictures are worth thousands of words each, so our next step was to clearly illustrate each area of need with highly communicative photographs. For the greatest ease of presentation and maximum impact we chose 35mm color slides taken by the professionals of the Academy's audiovisual support section. (A word of advice to those who would use this approach to documenting projects. Take a lot of pictures of what you want to show — close ups, middle, and long range. Then select only the very best and most descriptive shots for use in your presentation. Anything less than perfect slides actually detracts from what you are trying to say.)

Armed with a narrative describing the rationale, history, and scope of the MUST program and a pictorial representation of the problem, Colonel Hodge set out to get the resources needed for implementation of the program. At this point, the answer to "who needed to be convinced of the problem?" became clear — just about everybody.

On the Academy itself the problems were clear already, but we had to convince the key members of the staff that the MUST program was a viable program and our emphasis properly directed. To this end the assistance of the comptroller, public affairs, manpower and logistics sections was invaluable. The comptroller helped us put our proposals in order to meet Air Staff and POM criteria. Public affairs provided the positive media coverage needed to reflect the appropriate Academy image. Manpower and logistics inputs were vital to development of the best contract/in-house mix of work. The teamwork of the entire base staff helped get MUST off the ground. Now the MUST team needed more players to "keep it in the air."

Those players were the Air Force leadership. It was in the effort to inform those leaders of the Academy's situation that the slide presentation proved its worth. Colonel Hodge was able to give the Air Staff a pictorial tour of the Academy through the civil engineer's eye. Members of the Air Staff Board Support Panel and Program Review Committee came to Colorado to see first-hand the reality of our needs. Persons from the Office of the Secretary of the Air Force and the Office of the Secretary of Defense received the briefing. Key people in Washington, D.C., as well as distinguished visitors with an interest

in the Academy were made aware of its critical maintenance and repair backlog. The MUST team grew.

Realize, now, the magnitude of the MUST proposals: $30 million of enhanced funding over the next five years—not just a drop in the bucket. The program needed close control to keep it on track. Prioritization of projects was vital as was keeping the extra resources dedicated to needed maintenance and repair. The Superintendent of the Air Force Academy, Maj. Gen. Robert E. Kelley, has played an active role in this respect.

Specific areas of the MUST were grouped, assigned project officers and named to keep the program on track. Of primary mission importance is the cadet living environment—the cadet dormitories. General Kelley expanded on the MUST concept to include all aspects of the cadet dormitories from the structures themselves to the furniture and room accessories. This unique project is known as the General Upgrade in Dormitory Environment (GUIDE). Capt. Tom Udall is the Civil Engineering project officer for this effort.

The contract projects are the core of the MUST program. Capt. John Fraser, Director of Engineering and Environmental Planning, keeps track of the monumental design task of implementing MUST. The in-house portion of the plan has not been neglected. All civil engineering sections are involved in an ongoing upgrade of equipment under the title of Programmed Replacement of Equipment for Sustained Service (PRESS). Lt. Paul Scott is the project officer for this very detailed program.

Do all the fancy names and acronyms seem unnecessary to you? They perform an important function as part of our maintenance and upgrade plans. The names serve to focus attention on particular efforts. They facilitate communication and understanding of just what is going on. By encompassing specific activities with a unique title, we're able to more easily analyze and track the effort and resources dedicated to that particular portion of the MUST.

By now it should be clear that the Air Force Academy's MUST program is basically a systematic approach to establishing an effective, workable schedule to complete an otherwise unwieldy backlog of maintenance and repair requirements. That backlog came about through years of deferred maintenance. Understanding that fact critical?" I have never been that smart. I do not feel comfortable saying what conditions are going to be like in a quarter of a century. But there are some fundamental things we can safely predict. We know that disrepair becomes progressive. We must arrest deterioration. We must work today to minimize costs, do it in an intelligent way, based on the very best information available, using the best minds and the best advice on how to make investments today which will not put us into an untenable position tomorrow. Life-cycle costing became popular in the 1970s in terms of developing aircraft and other weapon systems. We need to apply this philosophy in our future facilities planning. To help us in this effort we are trying to build an Air Force Academy 21st Century plan so that we will have a construct of what it should look like in the year 2,000. We often forget we're now closer to the year 2,000 than to the Cuban Missile Crisis.

ESQ: Was the Air Staff receptive to your plans to systematically upgrade the facilities and the quality of life here?

GEN. KELLEY: It took work, but, I'm happy to say that the Air Force leadership and Air Staff were very sensitive to what the Academy ought to be. We laid out our case. We tried to do it in a logical and thoughtful way. We briefed them, brought them out and showed them and they quickly understood why we needed a MUST and a GUIDE program. They helped us get the additional funding to allow us to do maintenance and repair.

ESQ: What you perceive as a massive backlog in maintenance and repair is not apparent to tourists. What about incoming military personnel?

GEN. KELLEY: That is a frustration. Someone coming from Incirlik or Kunsan will say that it's wonderful while I'm saying that it's not good engough. The typical reaction is,"You've got to be kidding me!" At Nellis I had a relatively homogeneous population primarily consisting of TAC personnel, and they were aware of the reasons and purposes of "New Look." But here we have a relatively heterogeneous population that comes here from all major commands. First, they are impressed with the setting. Colorado is beautiful. Then they see the Academy — and it's not just picturesque — it's magnificent. They think that it's wonderful. It's an easier challenge to go into a place that is really in bad repair, and badly organized, badly set up and pull that team together, than to go into a place like the Air Force Academy where there is an expectation, a perception that everything is perfect — like Camelot.

ESQ: When new faculty and staff assimilate into the Academy family is there a challenge to maintain motivation?

GEN. KELLEY: Yes, because the Air Force Academy is different from the rest of the Air Force. It is our professional school. In that sense it is very similar to a college or university. But it is also much more. A bachelor of science degree at most colleges or universities is about 120 semester hours. We give them that plus. Our graduates will earn 145-148 academic credit hours and another 40 hours in professional military studies for a basic degree.

ESQ: Do you feel that you are now effectively dealing with the challenges?

GEN. KELLEY: Yes, I think we are. We established goals. In Col. Ralph Hodge we had a dynamic person who reached everyone in his organization, got everyone involved, and who allowed others to take responsibility, and he helped them achieve. He is a leader in the best military tradition. My services officer, Lt. Col. Jim Rosa, is very effective and capable. He has worked very closely with civil engineering, and his people have come up with some unique achievements. Our services people have been really receptive to the idea that more needs to be done. And you must realize that neither civil engineering nor services had the manpower needed. But in both cases, they did it. What I am saying is that I don't deserve any credit. Our people deserve the credit. I just had the opportunity of serving under General Creech. Last fall I was at Maxwell and I was talking to Maj. Gen. Dave Gray, who runs the Air War College. I said,"If you really want the students of the Air War College to have a really meaningful experience that deals with today's problems in the Air Force, then have them put together a case a study of what occurred in Tactical Air Command under General Creech beginning in 1978." It was a terrific period. He created, he instructed, and he taught a group of commanders to understand that there was this connection between your civil engineer and your services officer and the people who make planes fly and who fly planes. He taught us that people are influenced by the environment in which they live and work. He taught us that a commander must create an

environment in which everyone has the opportunity to live and work and be creative and grow — and be all that they should be and can be and will be. At Nellis, I inherited a civil engineering organization that was putting out fires all over the place. The civilian work force was being drained by higher paying jobs off base. So, you have to start building, teaching, training and organizing. Because of General Creech, because of his philosophy, we created an organization with pride.

ESQ: Speaking of pride, that is the sense you get in the airman's dining hall here at the Academy.

GEN. KELLEY: You know, that is an exciting success. We have won the Hennessy for the second year in a row. It was really a team effort, and that includes the people who clean up the tables. I walked in early one morning before 7:15, and I walked up to this one lady and I said, "Congratulations." You should have seen the smile on her face. There's the answer. They care. To win it two years in a row took some teamwork and — facilities improvements. That project had an impact not only on the attitudes of the people who work there, but the people who eat there. It lets our airman support staff know that we care about them and that the contribution that they make to this Academy is recognized and appreciated.

ESQ: How would you summarize the achievements of the Academy in recent years.

GEN. KELLEY: First, I think that General Tallman made a significant turn with the beginnings of the MUST program. Underneath the ground, beneath buildings, behind walls there were needed improvements. I am talking about concrete problems, affecting the very life blood of this facility. But, we had to also deal with the quality of life that we provide to our cadets and airmen. And we are now upgrading the dormitories. I really would like to improve the Mitchell Hall dining facility, in terms of the quality of food and service, and in terms of the efficiency of the building. There are other needed repairs caused by the continual and intensive use of some 4,500 cadets. Why we do it must be communicated. The philosophy is important. To do it requires teamwork, planning, programming, funding and execution. The result is a new sense of pride and professionalism and discipline in our cadet corps and in the future leadership of the United States Air Force.

E&S

Maj. Gen. Robert E. Kelley is superintendent of the U.S. Air Force Academy, Colo. After attending Peekskill Military Academy, Conn., he went to Rutgers University where he graduated with a bachelors degree. He received his master's in international affairs through the George Washington University, Washington, D.C. He is also a graduate of the National War College at Fort Lesley J. McNair in Washington, D.C. General Kelley was named the Academy's ninth superintendent in June 1981. He was interviewed in his offices at the Academy.

First Lt. Jerry P. Haenisch is chief of Industrial Engineering Analysis at the 7625th Civil Engineering Squadron, USAF Adademy, Colo. He graduated in 1978 summa cum laude from the University of Maryland with a bachelor of science degree in management. In 1980 he earned a second bachelor of science degree in industrial engineering from the University of Illinois under the Airman's Education and Commissioning Program (AECP). Lieutenant Haenisch is an Engineering-in-Training (EIT) in Illinois and a member of the Society of American Military Engineers. Prior to his commissioning through OTS in 1980 he served for 13 years in the power production career field at bases in Germany, Thailand, Alaska, and in the CONUS.

gives yet another dimension to the MUST concept. Although initially a five-year plan to renew deteriorated facilities the process of proactive identification of needs is always viable. The various channels established to report and document needed maintenance and repair work remain open. The process should continue.

MUST and its various sub-programs have been widely communicated to the Air Force Academy community. Public Affairs, through the ***Falcon Flyer*** newspaper helps us keep the people of the Academy informed. Project starts and completions as well as new proposals and ideas are highly publicized. We actively solicit the inputs and participation of the Academy populace. Each interaction with the CE customer enlarges the working team. People see the results of their efforts and ideas and are encouraged toward even greater success. Right now the first of the MUST projects are under way.

- 1900 linear feet of underground high temperature hot water lines are being replaced. Concrete troughs will enclose the new pipes for better protection and easier maintenance in the future.
- Phase I of the GUIDE program has begun with the general upgrade of 600 cadet dormitory rooms and living areas. Besides new paint and carpeting, over 11 miles of piano hinge will be used for wardrobe doors. A similar length of rubber base moulding will also be needed for the repairs. The first phase cost is $1.8 million.
- Two million dollars is earmarked for new dormitory furniture to complement the extensive repair work of the GUIDE project.
- Another major project but much less visible than the dormitories is the contract to clean the 42 air-handling duct systems in the academic building, Fairchild Hall. Consider that Fairchild Hall contains 1.2 million-square-feet of floor space and you will have an indication of the scope of this project.
- Other MUST-related endeavors include exposed aggregate repair, replacement of the Parchall flume at one of the nonpotable reservoirs, maintenance of the many gym floors in the athletic building, and general upgrade of the enlisted dormitories.

Time and a visit to the Air Force's Academy in 2005 will provide us a true measure of how well MUST has served its purpose.

E&S

Leaking roofs, damaged property, wasted energy for the BCE. It could be . . .

the finishing touch

by Harry R. Marien

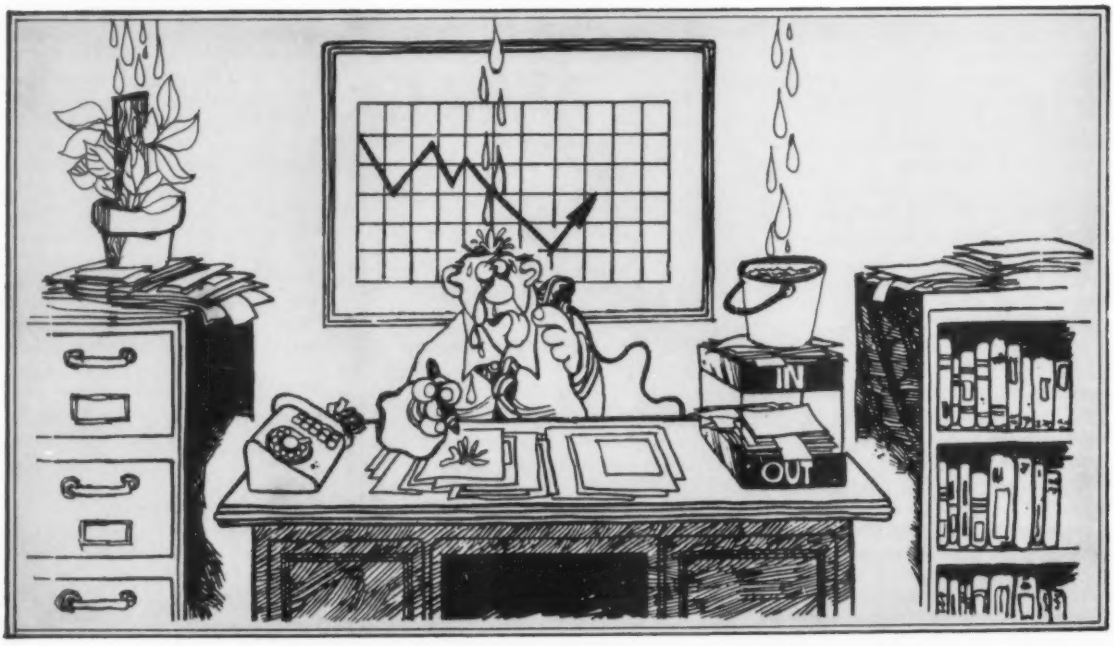
Painting and carpet complete, the renovated facility is the pride of the base commander and Consolidate Base Personnel Office occupants as well as the base civil engineers. On the next base visit by the command deputy chief of staff for Engineering and Services he is shown through the building to view accomplishments. What's this? A stain in the ceiling over the base commander's desk; people commenting about not having to water the green plants in the office when it rains; mold in the corners of the reproduction room. Recriminations ensue and sure enough roof repairs were deferred because of "limited contract dollars." It could be the finishing touch for the base civil engineer.

A secure roof system is perhaps the most important component in the functional performance of a facility. A leaking roof irritates personnel, damages property, wastes energy and can cause structural damage. It also costs dollars to repair the cause and the effects of the leaking roof—dollars that can be better used.

The Air Force has developed methods to quantify the condition of your roof, decide what repairs are needed, make durable in-house repairs or prepare contract specifications. The contract specification provides architectural details, material selections, a quality assurance program and a performance agreement in an easy to use format. AFM 91-36,"Built-Up Roof (BUR) Management Program" describes a systematic approach to improve BURs in the Air Force.

The seeds for the manual were sown when Strategic Air Command found they were spending too much money for built-up roof repairs. A consultant was hired, 23 SAC bases were visited, interviews were conducted, 70 million square feet of roofs surveyed and causes were determined. As it turned out, an estimated $6 million each year was being lost because 20-year roofs were only lasting 12 years. The results of this study led to the development of AFM 91-36. After four years of hard work it was published Sept. 3, 1980.

The manual describes Air Force policy for built-up roofing systems. In the manual you will find that two people in the base civil engineering organization play a vital role in the management of BURs, the roof



engineer and the roof technician. They prepare a roof data base by surveying the BURs, computing a Roof Condition Index (RCI) and putting together a file for each roof. The RCI is a simple quantitative method that permits comparison of roofs or evaluations of the same roof at different times. Together, the building priority list and the RCI can be used to set technical priorities for repair. A method of economic analysis is also provided in AFM 91-36 to aid in the decision making process.

In-house roof repairs are limited to cold methods; hot tar kettles have been eliminated. It was found that cold repairs last 6-10 years, almost as long as hot repairs and are much easier and safer to perform. Cold repair methods and a list of proven materials are described in the manual. All hot repairs will be done by contract unless specifically waived by a major air command.

Perhaps the most innovative part of AFM 91-36 is the guide specification contained in Chapter 5. It is written in the Construction Specification Institute (CSI) format so the engineer can easily choose the standards and details that apply to his design needs. The specification is written to use proven materials and to hold the contractor accountable for his work.

The accountability represents a new approach in getting the roof you have paid for. Specifically required is:

a. A certification from the BUR manufacturer that the contractor is authorized and approved to apply his product and that the product is appropriate for the intended use.

b. A 5-year performance agreement signed by the contractor.

c. A letter from the contractor appointing a quality controller.

d. Daily submittal of quality control sheets by the contractor describing variances from the specifications.

e. Daily sampling of the completed BUR.

f. Laboratory analysis of BUR samples.

These items, together with the specification, quality assurance inspections by the government technical representative, and written communications between the contracting officer and contractor form the legal basis for insuring a good roof. AFM 91-36 even provides a listing of suggested actions to be taken in the event deficiencies are found in tested samples.

The specification provides a system of checks that permit the early detection of a poor quality roof installation and the documentation necessary for successful legal action to the contractor or BUR manufacturer should it be necessary. During the FY81 construction season SAC saved $225,000 in direct contract costs through use of this specification. The savings were far greater when the increased quality and life of the roofs installed is considered.

Salesmen will come to your base to tell the virtues of new roofing systems and show you a book full of testimonials from private industry users. After all factors are considered—guarantee, durability, watertightness, historical performance, ease of repair, etc.—a careful analysis will show that the per year cost of these systems is greater than a BUR bought in accordance with AFM 91-36. Your command roofing engineer can help you implement the features of AFM 91-36 and with specific roof problems you may have.

When rehabilitating facilities, don't forget the roof. Procedures in AFM 91-36 provide management and technical tools that, when used with good engineering judgement, assure a competent job. Give your rehabilitated building the finishing touch of a secure roof.

E&S

Harry R. Marien is a graduate of Dickinson College, attended the University of New Mexico and holds a master of sciences degree from Purdue University. His previous work assignments have been with the Air Force Weapons Laboratory, Kirtland AFB, N.M.; deputy base civil engineer, Torrejon AB, Spain; civil engineer for the HQ U.S. Air Forces in Europe, operations and maintenance division; and research civil engineer for the Engineering and Services Laboratory, Tyndall AFB, Fla. He currently is assigned to the Directorate of Operations and Maintenance, AFESC, as a structural engineer with primary responsibility for the Air Force roofing program.

Quarterly Notes

Quarterly Circulation Free to E&S

Policy controlling the circulation of the **Quarterly** insures that all Air Force Engineering and Services organizations receive the periodical free.

Standard issue rate calls for one copy for each five personnel at the unit level. Each unit is responsible for ordering sufficient copies. This is done with the Air Force Form 764a, submitted to the Servicing Publications Distribution Office. Population is based on the total active duty and reserve military force, plus the civilian strength.

Organized units in the reserve forces should use the identical rations and procedures to get the **Quarterly** distributed to their organizations.

Personal, home copies are restricted to a small tight controlled mailing list maintained at the **Quarterly** offices, and to those who subscribe through the Superintendent of Documents, Government Printing Office, Washington D.C.

The Long Hot Summer

Our apologies for a very late summer issue of the **Quarterly.**

A somewhat late issue became very late with the major changes at the top of Engineering and Services.

One of our missions is to inform, and the leadership structure is information that is vital throughout Engineering and Services.

The **Quarterly** will be on a revised schedule, with the Fall issue distributed in early November. The Winter issue of 1981-82 will be distributed during early December.

In the meantime, we sincerely hope that the "Indian Summer" issue of the **Quarterly** is as informative as we tried to make it. **The Editors.**

Getting a Face-lift

by Capt. Elton Strange

Do you have severe maintenance and repair problems with your exterior sidings? If you are like most Air Force bases your answers are a definite,"yes."

At Rhein-Main Air Base we have been especially plagued with these problems in Gateway Gardens, our on-base housing area. These problems have existed for many years and basically deal with excessive exterior surface cracking, blistering, peeling and spalling. Most of our housing units were built shortly after 1945 of WW II masonry rubble with the interior wall surfaces consisting primarily of plaster and the exterior wall surfaces of stucco. Originally, this style of construction allowed moisture to travel freely through the wall. However, over a period of 30 years numerous coats of paint have slowed this free flow of moisture. Consequently, the moisture condensation within the wall has caused an annoying problem of blistering, peeling and spalling on the exterior wall surface.

Corner of building, with left stuccoed with first layer and nylon mesh, right side finished.

To properly repair the wall requires the laborious task of stripping the old paint from the wall, removing all loose stucco, and restuccoing the wall surfaces as needed, and repainting. An extremely time consuming and expensive solution. Because of the great expense, we elected to do only spot repair and maintenance (i.e., repaint the peeled and spalled areas). However, about three years ago our problem became so bad that spot repair was no longer effective.

Like everything else the time had come to tackle the total repair and maintenance job. Since this meant the entire building would be basically stripped of both the old paint and stucco, I though that it might be beneficial for us to look into the possibility of insulating the exterior walls. Remembering an insulation project I had designed at Hanscom AFB, Mass., I queried the local engineers to see if there was a

similar insulation system here in Germany. The results of their investigations were delightfully surprising. A system quite similar to the one designed at Hanscom was readily available and it was also quite popular. This system is basically a rigid foam insulation that is either glued or anchored to the exterior face of the wall. A pigmented stucco, embedded with a nylon mesh screen, is then trowelled onto the foam to provide an extremely durable wearing surface and finish.

To obtain the needed Operations and Maintenance funding for this system, though, we had to show a significant cost effectiveness. Our heat loss calculations showed an existing exterior walk "U" value of only 0.287. To obtain the desired 0.1 factor, as specified in AFM 88-15 for our type of climate, the German engineers determined an additional $1.45 per square foot for the insulation would be required above that to remove the old paint and loose stucco, restucco, and repaint. Even though this meant an expensive job was going to be even more expensive, we found that we could recoup the additional cost to insulate in just 6.36 years. This represents a large BTU savings per building (56 apartments) of 1700 MBTU per year. Based on a gallon of fuel oil costing $1.20, this means a savings of $14,671 per year per building. Of course, these savings will increase as inflation raises the price of fuel oil to even higher levels in coming years.

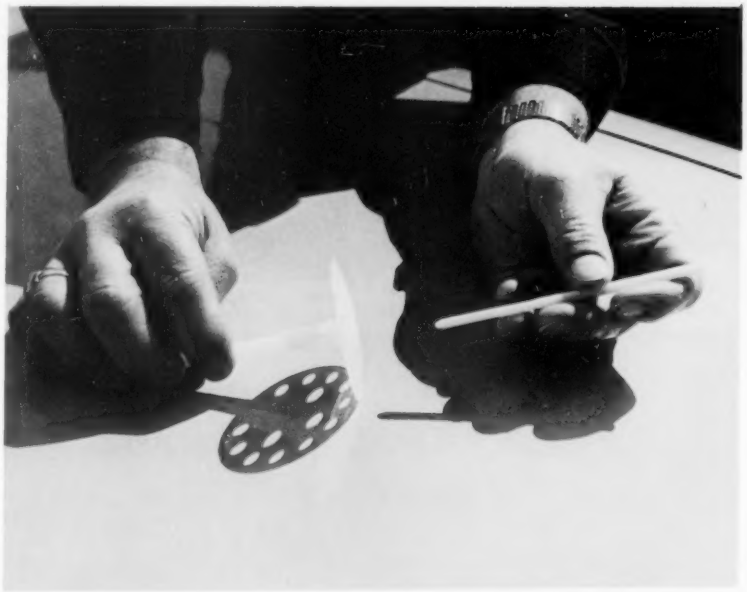
Having all the necessary data collected we then submitted to Headquarters Military Airlift Command our programming documents for approval and maintenance and repair funding to insulate one of our 56-apartment star-shaped buildings and six of our small 14-apartment rectangular-shaped buildings. MAC, with great optimism, quickly approved and funded the project. As of this writing, several of the buildings have been finished and the project is now almost complete. Hopefully, if everything (mostly weather) goes right we can have the entire project completed during the summer. For those buildings we do have complete, our first impressions of the insulation system and the occupant responses are excellent. One obvious result is a home with less infiltration of air and moisture.

Meeting with success, this project has now become the first phase of Rhein-Main's comprehensive program to repair the entire Gateway Garden family housing complex. We still have seven large 56-apartment buildings and 11 smaller 14-apartment buildings yet to do. Once this work is complete our savings in terms of BTUs per year for the entire housing area will be over 14,185,000,000 (BTUs). At today's fuel oil costs ($1.20/gallon), that's over $122,000!

In addition to saving us fuel oil dollars, this system is providing us with many other side benefits. First of all, we can apply the insulation to the exterior of the building without vacating apartments or disrupting the occupants. Nor do we lose valuable floor space that we would if we use an interior wall insulation system. Also, since the special stucco finish is pigmented, periodic repainting of the building is not required as frequently. (Fading is an unknown factor at this time.) This in itself amounts to a significant long term savings. Another benefit of the stucco finish is its durability, which is achieved by embedding a nylon mesh screen into the stucco as it is being trowelled on. The result is a finish extremely resistant to cracking and chipping. In fact, it is so hard it is very difficult to rupture the surface even from severe impacts such as rocks and baseballs - a good thing to have in a housing area with lots of kids.

This system has immense possibilities for the architect, too. Since the insulation system is of rigid foam and stucco, curves, irregular surfaces, and difficult shapes can easily be insulated or new shapes can be formed for architectural flare. Hence, some of the more mundane looking buildings that are generally found on Air Force bases can be spruced up at a

Facility cleaned and ready for insulation.



Close-up of anchor, made of plastic with straight piece (left) fitting into the other, forcing expansion and providing the anchor.

CAUTION

Here's a checklist for those who want to follow the Rhein-Main AB example:

1. Check Qualities of Rigid Foam Insulation—Some insulants give off toxic or noxious gasses under heat. Others may lose their structural qualities over time.

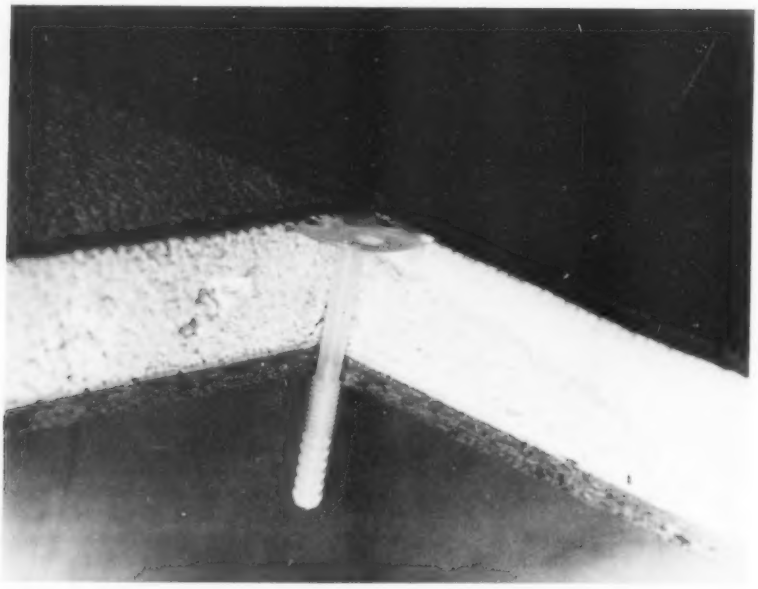
2. Measure for Energy Savings—Some estimates of heat transfer do not accurately reflect variations in building techniques. Some apparent benefits result more from better sealing than reduction of heat transfer.

3. Test—Get a sample application for test of pigment fading resistance, effects of normal wear and tear, and heat transfer properties.

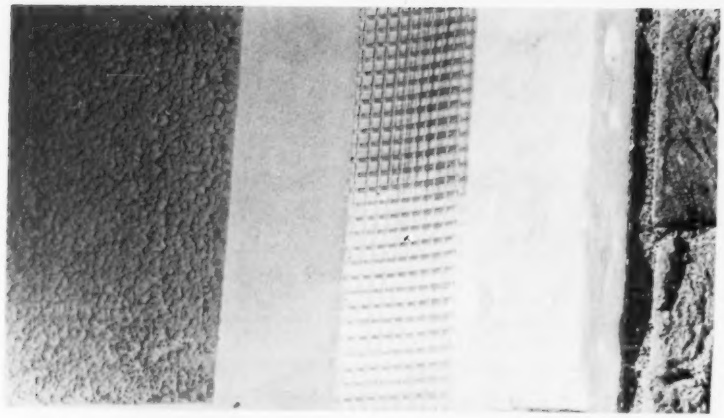
4. Get Approval—AFESC/DEM will assist bases upon request of MAJCOM, SOA or DRU DEs to evaluate new building surface technologies.

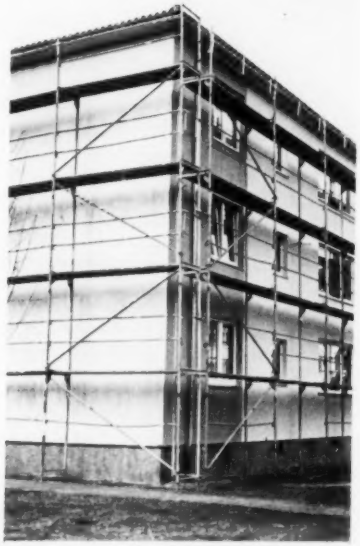
There have been numerous similar projects, including Sembach AB, Luke AFB and Robins AFB. It is important to carefully observe results and record findings. This is the way we will know what works best, lasts longest and provides optimum benefits per dollar.

UPPER RIGHT: Workman drilling holes to receive anchors.
BELOW: Cutaway sample showing anchor detail.



Workman placing anchors, with straightpiece driven to set anchor.





Capt. Elton L. Strange is currently assigned to the Alaskan Air Command Inspector General Team. Previously he served Rhein-Main AB, Germany, in charge of off-base support for all Military Airlift Command tenants in Europe. He holds a bachelor of arts degree in environmental design from the School of Architecture at the University of Washington.

CLOCKWISE FROM LEFT: Front of building showing completed finish coat: completed system on Building 606 in its natural surroundings; cut away showing entire insulation systems and view showing completed finish on the right side and first layer of stucco with embedded nylon mesh on left side.

small additional cost at the same time the building is being insulated.

Lastly, since the insulation is applied to the outside surface, our masonry wall is now a better heat retaining system and less condensation now occurs. A difficult moisture problem is reduced.

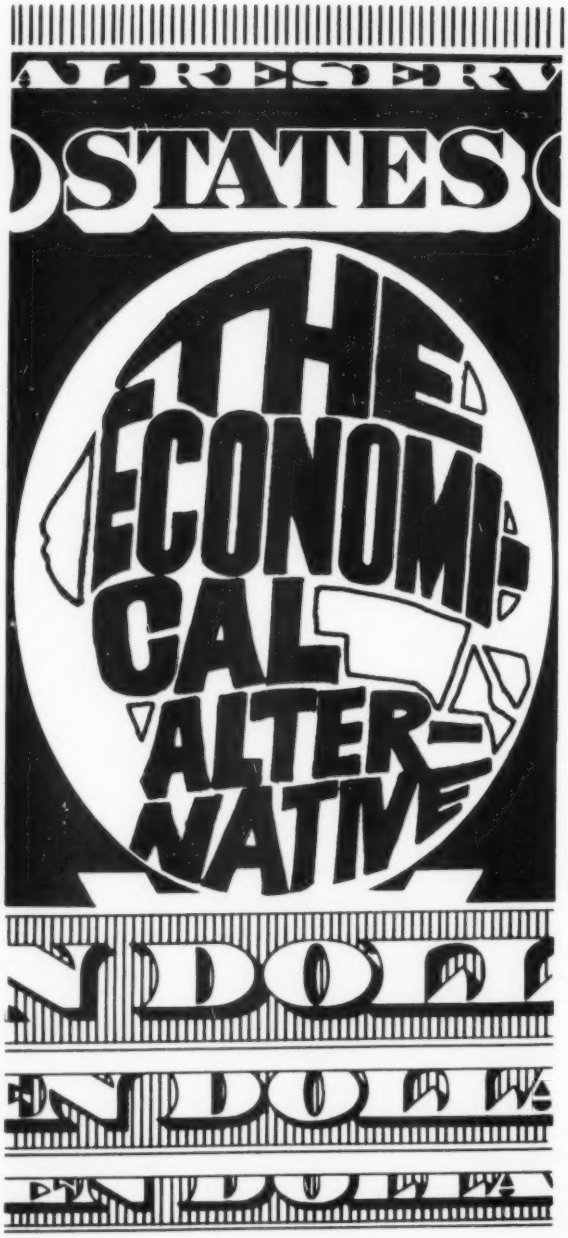
This system, as you can see, has provided many outstanding benefits in the repair and maintenance of our housing units. We have also used just the stucco nylon mesh finish on numerous masonry buildings, where insulation was not required. This use promises to eliminate or reduce extensive maintenance and repair work previously required on these buildings. We are now considering using the insulation and stucco finish system on other base buildings such as our dormitories where insulation is deficient and extensive wall surface repair and maintenance are needed. Ultimately, our goal is to reduce both the base's huge consumption of energy and the base's excessively large maintenance and repair bill.

This insulation system, of course, is not a cure-all. With each and every project, it is necessary to evaluate all facets to insure cost effectiveness. For us, though, this system has resolved a big problem and has also proven to be cost-effective. If you are interested and would like to investigate the possibilities of using this system, DRYVIT System Inc., 420 Lincoln Avenue, Warwick, RI 02888, is a primary supplier in the states. There are probably other companies with similar systems, but this is the only one that I'm aware of.

E&S

"asphaltic concrete...extensively cracked and severely oxidized."

RECYLING...



by Lt. Richard A. McDonald

Lajes Air Base is located in the northwest corner of the island of Terceira in the Azores. Constructed in 1942 by American and British Forces the pavement at Lajes consists of two runways, eight taxiways, and 1,108,130 yd2 of apron area. Since 1942 Lajes has experienced thousands of aircraft operations, including operation Nickel Grass (the MAC airlift to Israel during the 1973 Yom Kippur War), and as might be expected the repeated loads and the semitropical climate have taken a toll. The asphaltic concrete at Lajes is extensively cracked and severely oxidized. In order to provide the most effective and economical repair alternative Military Airlift Command in conjunction with the 1605th CES selected hot mix recycling.

With construction material costs ever rising, and quality aggregate becoming increasingly difficult to obtain, we as engineers are in search of solutions to these problems. An increasingly attractive solution is recycling. Recycling has several advantages.

a. Hauling costs are minimized.

b. The quality of the reclaimed aggregate is assured.

c. The quantity and cost of virgin aggregate is minimized.

d. The quantity and cost of fresh binder is minimized.

e. Grade control is superior — primarily a concern of state departments of transportation (bridges, underpasses, etc.)

f. Full depth recycling provides a maintenance and repair alternative which may eliminate the problem of reflective cracking.

g. Recycling minimizes the solid waste disposal problem.

h. Recycling saves energy.

Terceira, a 10-by-20-mile island, is situated roughly 850 miles off the coast of Portugal. As such most construction materials must be obtained on-site or shipped a considerable distance. Of particular interest to any paving operation is the availability and quality of aggregate. Terceira has five active quarries. Three of the five are controlled by the Portuguese Government and as such are restricted to public works or maritime use. A fourth quarry, near the township of Vilha Nova, produces a volcanic basalt. The Vilha Nova quarry was disqualified as an aggregate source because the basalts resulted in eratic stabilities. The fifth quarry is located in the city of Angra. Only the Angra quarry produces aggregate acceptable under Corps of Engineers specifications.

The areas being recycled are severely distressed taxiways and apron areas. Pavement Condition Indices (PCI) on these features ranged from 0 (Failed) to 53 (Fair), with the average features being classified as Poor (PCI 25-40). Roughly 1,336,000 square-yard-inches of asphaltic concrete (AC) and coal tar rubber concrete (CTRC) are scheduled to be cold milled and 84,000 tons of recycled hot mix asphalt concrete is scheduled to be placed. Of the materials milled only the reclaimed AC is used in the hot mix. The CTRC is stockpiled and will be used as a base material. Included in the job are plans for 38,000 tons of new aggregate 2,520 tons of new asphalt cement, and 790 tons of AC modifier.

The hot mix recycling plant was erected on a closed runway. The plant, a drum mix, is rated at 250 tons per hour. Within the drum virgin aggregate, li-

quid asphalt, reclaimed material and asphalt modifier are mixed. Virgin aggregate is introduced at the burner end of the drum, reclaimed material is introduced midway in the drum and asphalt cement and modifier are introduced at the conveyor end of the drum. The modifier, "Paxole" is used to increase the maltene fraction of the milled material and thereby extend its fatigue life.

A vital ingredient needed to assure the success of any paving operation is good quality control. In this regard, the services of the Waterways Experiment Station proved invaluable. As is common with paving construction, problems do arise and the Lajes effort held true to this axiom. The first of such problems was meeting the job specification. Basically the problem was with excess fines. The job mix called for 3 to 6 percent minus 200. This specification was considerably difficult to meet in that the reclaimed material carried 10 percent minus 200 material and the fine aggregate had 11.5 percent minus 200. The proposed job mix called for 60 percent reclaimed material, 20 percent fine aggregate, 15 percent coarse aggregate, and 5 percent sand. As such, the expected minus 200 fraction was around 10 percent. In an effort to reduce the minus 200 content, a decision was made to procure an aggregate washer. The washer, rated at 100 tons/hr, was shipped and received three weeks after ordering. In the interim Lajes personnel and contractor personnel made preparations for the arrival of the washing plant.

Four washing ponds were dug in anticipation of the washer's arrival. Each pond is roughly 45' x 35' x 6'. The ponds are aligned in a stair-step fashion. Basically each separation pond is approximately two feet lower than the preceding pond. In this array the first pond facilitates the precipitation of most of the fines and in turn bleeds into the second pond. The second pond facilitates the precipitation of a decreasing amount of fines and in turn bleeds into the third pond. In the fourth and final pond fresh water is introduced into the system. In turn, water in the fourth pond is pumped back into the separation bin. Due to the substantial percentage of fines in the aggregate and the desire to remove as large a percentage of minus 200 material as possible, it was decided that a second wash cycle is needed. The washing operation is effective in that 98 percent of the minus 200 material is removed as a result of both wash cycles while only a small amount of material retained on the 200 is washed away.

An additional problem encountered was that of not getting the proper density. The specifications required a lab density of 98-100 percent in the mat and 97-100 percent in the joints. The high percentage of minus 200 material and improper rolling equipment were suspected of causing the low densities.

By washing the fine aggregate we were able to lower the percent fines to eight percent of the mix. The rollers used by the contractor were two steel wheel vibratory rollers each weighing about eleven tons. After a series of test strips using the steel wheel rollers failed to approach the 98 percent density specification a decision was made to procure a 25-ton pneumatic tired roller. Reasoning followed that the kneading action of the pneumatic tired roller would provide higher densities and, as expected, the mean density in the mat increased an average of 1.5 percent while the mean density in the joints increased an average of four percent.

The bottom line of virtually all construction efforts is cost. It is estimated that the initial cost savings of selecting the recycled options is in excess of $1 million. For every 10 percent increase in the reclaimed material the 1605th CES would save $200,000. (Note: Potential maintenance savings are great. Full depth recycling may eliminate reflective cracking — a significant problem with AC overlays.) Recycling's cost savings are in the area of reduced raw material requirements. The 3,310 tons of asphalt cement and asphalt modifier cost $1,160,500. A project using six percent virgin binder would increase the cost by $400,000. Virgin aggregate which comprises between 35 and 40 percent of the mix costs $15.57/ton. The use of one hundred percent virgin aggregate would cost $1,229,400 — an increase of $637,700.

The Lajes effort is one of an expanding number of airfield recycling efforts undertaken by the Air Force. The first such effort was undertaken at Pope AFB, by HQ MAC, Waterways Experiment Station and the 317th CSG. With the distinct advantages offered by recycling the number of projects will undoubtedly increase. A solution must be found to the problem of costly and poor quality materials. One promising alternative is recycling.

E&S

First Lt. Richard A. McDonald is assigned to the Air Force Engineering and Services Center as a research engineer in the Airbase Facilities Branch of the Engineering and Services Laboratory. He earned a bachelor of sciences degree in civil engineering from the Virginia Military Institute and a master's in business administration from the University of West Florida.

worth noting

SAME MEDALS HONOR USAF GENERALS

Two retiring Air Force generals were recipients of the high awards bestowed by the Society of American Military Engineers at its convention in San Antonio, Texas, April 21-24.

Maj. Gen. William D. Gilbert, president of the society from 1980-81, received the coveted Gold Medal. Brig. Gen. Paul T. Hartung received the Newman Medal.

General Gilbert was honored as the Society's member rendering the most conspicuous and meritorious servie to SAME during the previous calendar year. Louis W. Riggs, Tudor Engineering Co., San Fransisco, SAME president for 1981-82, presented the award.

Instilling new life and vitality into SAME was the key justification for the Gold Medal, setting new directions for the society. General Gilbert was cited for setting SAME's first goals and objectives, providing an outward directed effort supporting the entire engineering community and focusing the society's efforts on major contemporary issues such as energy, the environment, productivity, readiness and improving communications between the armed forces and the private sector.

Among the significant contributions for which General Gilbert was honored was serving as the major driving force and decision maker when the society acquired a new national home in historic Alexandria, Va. General Gilbert led the efforts of the executive director and a blue ribbon panel in finding an investment property with high value appreciation.

During the tenure of General Gilbert as society president, there was growth in both individual and sustaining membership.

General Hartung, deputy director of Air Force Engineering and Services for the Israeli Air Base Program, was cited for his lasting contributions to peace in the Middle East. This was through development of bases needed to compensate the Israelis for facilities in the Sinai desert which they gave to Egyptians as part of the Camp David peace accords.

"A country boy from Louisiana," Maj. Gen. William D. Gilbert received the gold medal awarded by the Society of American Military Engineers from Louis W. Riggs, 1981-82 president of SAME, honoring him for his year of unprecedented achievements as SAME's 1980-81 president and for his continuing leadership.

General Hartung was nominated by General Gilbert to lead the joint DOD and Israeli air force survey team which located two potential base locations in the Negev desert. The team concluded that two completely operational bases could be turned over to Israel in three years using concurrent design, procurement, construction and site activation.

General Hartung was made DOD program manager for the project, which employed more than 8,500 people from five nations and involved cooperation between the U. S. Army Corps of Engineers as construction agent and U. S. firms employed to achieve new capabilities in the barren Negev wastelands.

"Our man in the Holy Land," Brig. Gen. Paul T. Hartung, receives SAME's Newman medal from General Gilbert for his achievements as project officer for the Israeli airbase construction program, in which he acted as central Department of Defense liaison to the Israeli air force, the Army Corps of Engineers, and the contractors (SAME 1981-82 president Riggs looks on). Subsequently, General Hartung received the Meritorious Service Medal from General Gilbert in Pentagon ceremonies as he retired following a career of nearly 35 years.

Other Awards

The 436th Civil Engineering Squadron, Dover AFB, Del., was awarded the Curtin Plaque, named for Maj. Gen. Robert H. Curtin, former Air Force Director of Civil Engineering.

Dover AFB's civil engineers were repeatedly cited by the Air Force Civil Engineering and Services Management Engineering Team (CESMET), the Military Airlift Command's CESMET and Inspector General for leadership, management, innovations, commitment to improving the quality of life and superior customer relations.

Awarded the Goddard Medal was SMSgt Dennis J. McAvoy, 36th Civil Engineering Squadron, Bitburg AB, Germany. The medal is named for Maj. Gen. Guy H. Goddard, former Director of Civil Engineering for the Air Force, and past SAME president in 1970.

Sergeant McAvoy was cited for outstanding performance, significant contributions to military troop construction, base structural maintenance, exemplary technical skill, leadership ability, outstanding bearing and conduct, all contributing to major achievements in civil engineering support to the only F-15 wing in Germany.

(Both the Curtin Plaque and the Goddard Medal were announced at the Engineers' Week Luncheon, Bolling AFB, D. C., February 25. See the ***Quarterly,*** Spring, 1982.)

New Associate Editor Onboard

The staff of the ***Engineering & Services Quarterly*** grew with the arrival of the associate editor, Sgt. Lea G. Blake.

Sergeant Blake is now the primary contact for departmental submissions (Worth Noting, CESMETtips, TECNOTES and Current Emphasis).

To contact her, label or tag your submissions with the department to which they belong and send them to: Associate Editor, Engineering & Services Quarterly, HQ AFESC/DEJ, Tyndall AFB FL 32403. She can also be reached by calling AUTOVON 970-6148 or 6476.

Mortuary Officer Dies

William G. Courtney of the Air Force Manpower and Personnel Center died Aug. 30 at his home in Schertz, Texas. He served as chief, Air Force Mortuary Services, from 1975 until his death.

He was born Aug. 31, 1941 in Brooklyn, N.Y. He is survived by his wife Doris, two children, Billy and Christina, and his mother Lillian Courtney, all of Schertz.

Funeral services for Mr. Courtney were at Universal City, Texas.

SARPMA Gets Public Affairs Recognition

San Antonio's Real Property Maintenance Agency (SARPMA) received recognition in the Program Bulletin serving the Director of Public Affairs for the Secretary of the Air Force (SAF/PA).

SARPMA commander, Col. Kenneth W. Canfield, was cited for his effective approach in internal communications, featuring his SARP-MAW Grams. Colonel Canfield told the San Antonio people benefiting from SARPMA, "Communicating to some 2,500 people located at many locations in the San Antonio metroplex is extremely difficult. While we have a hard time getting out the straight word, rumors race through the agency with the speed of light! So, we created a fictitious character called 'SARP-MAW' who passes out the ungarbled word through 'SARP-MAW Grams.' We feel that having informed employees improved morale, productivity and service to you, SARPMA customers."

Lt. Col. John C. Walmsley Air Force Service Information and News Center, Kelly AFB, Texas, observed, "it's one of the best down-to-earth efforts at candid employee communication we've seen lately, and we bet it's effective."

The SARP-MAW Gram, attached to the bulletin, dealt with the sensitive and often controversial subject of contracting-out. Published in answer to employee rumors, it noted that the events outlined in Office of Management and Budget Circular A-76 had not begun. Outlining all of the facts, the pamphlet also included some related, unpublicized management actions affecting employees.

Communication is an important process. Effectively getting the word to employees can take many forms. The SARP-MAW Gram is a good example of the personal approach to communicating because it didn't flinch from the truth, addressed employee concerns in a timely way and didn't use language that only a manpower expert could understand.

Dr. Lawrence J. Korb, Assistant Secretary of Defense (manpower, reserve affairs and logistics, shown at left) presented the Honorable Mention for the Secretary of Defense Natural Resources Conservation Award to Myrtle Beach AFB, S.C. Receiving the award were Col. J.R. Nevers, commander, 354th Combat Support Group (right) and Mr. Richard Williams, chief, Environ mental and Contract Planning (not shown), Myrtle Beach. The DOD program encompasses more than 19 million acres of America's natural resources. The award recognizes outstanding achievements in maintaining these areas.

Runners — Maj. Gen. Clifton D. Wright Jr., Director of Engineering and Services, Headquarters USAF, is shown presenting a first place age division ribbon to Amanda Slocumb during the first Engineer's 5-10K Runs. The runs were held in Panama City, Fla., February 27. sponsored by the Panama City Post of the Society of American Military Engineers, the runs benefited their Scholarship program. Over 160 runners participated in the event. Slocumb won the 10K woman's 14-and-under age category with a time of 24:20. General Wright placed third in his age group for the 5K event, and first place among general officers.

Texas ANG Gets New Facility

The Air National Guard's 149th Tactical Fighter Group at Kelly AFB, Texas, will get a new, dual-purpose facility for corrosion control and fuel cell maintenance.

The composite facility will accommodate the functions of opening, cleaning and repairing fuel tanks, says Col. Harold H. Blackshear, 149th Civil Engineering Flight commander. It will also serve for corrosion control, removing and applying paint, and fiberglass work. Its 11,000-square-feet will admit two of the group's F-4C Phantom II supersonic fighter-bombers for servicing at the same time, according to the colonel.

Some $1.3 million has been budgeted for the project according to 149th officials. Construction completion is planned for June, 1983.

Kelly officials said the contractor will provide labor, equipment and materials. The 149th civil engineers will inspect and provide surveillance.

GETTING A HANDLE ON CO$T

by Maj. Edward L. Parkinson

One of the most serious issues facing the people who program, plan and execute major acquisition programs is the cost overrun. It disables credibility and consumes thousands of expensive manhours spent testifying, reestimating, auditing, reprioritizing requirements, and high-level second guessing. Although this article lends itself to major weapons system acquisitions as well as construction it deals with the latter.

- Why has the Air Force had cost growth on its major construction programs?
- What are the causes?
- What are the cures?

The current Air Force leadership is keenly sensitive to the problem of cost growth, and is delving into the answers to these questions with an open mind. The zeitgeist of past incomplete and insufficient planning and misestimation haunt today's leadership. As a result of these realities, today's leadership is dedicated to making the necessary changes in the way we do business to lessen the risk of cost growth on major programs of the future.

Genesis

Understanding what has gone on in the past provides us with a foundation for tomorrow. The Director of Engineering and Services, the Air Force Secretariat and the Department of Defense have concurred that there is a need to more accurately assess our needs, and control of programs from concept through design and the acquisition process.

Toward creating a central resource capable of reviewing current and future proposals and recommending change, a new organization was created at the Air Force Engineering and Services Center, Tyndall AFB, Fla. Known as the Construction Cost Management Group, its charter is threefold.

- First is to develop a ***now*** capability to support independent cost analysis requirements on major construction programs currently on the books and in the early planning stages. Major programs are those designated by AF/LEE, principally multi-year programs, large or complex programs, and in particular programs that are tied to providing a weapons system or operational capability.
- Secondly the group's charter is to support improvement in the construction cost management process. This ranges from the Planning, Programming, and Budget System (PPBS), the organization and management system, to the implementation or actual construction phases.
- Third is to influence the definition and justification of future Air Force programs.

In carrying out this new charter, contract support and a modest application of computer capability will be used to facilitate the work of a relatively small number of people. This article deals with some philosophy underlying this new organization, the ways in which it will be employed, and how it will deal with the Air Force facilities process in accomplishing its primary mission: Getting a handle on cost.

When Does Cost Growth Begin?

Cost growth, for practical purposes, begins in the program advocacy, early planning phase, predefinition or in the concept phases. The baseline for measuring cost growth may very well be established the first time that an estimate gets communicated to higher level management, whether it be in a decision/advocacy briefing, or in the Program Objective Memorandum (POM) process.

This is where hindsight shows that early planning has included optimistic or unrealistic cost estimates based on inaccurate or unconclusive assumptions and unrealistic or unworkable schedules. The early phases are where estimates are made before adequately defining the construction program.

Frequently, there is not enough effort expended to perceive how the total program will actually look. For example, early programming of construction for advocacy, political reasons, or merely to make the program competitive to get it started, may assume optimistic beddown requirements that change drastically before the funding year.

Many times construction is estimated without adequate consideration of schedule risks. Then when the program slips or gets started late, second and third level detail work schedules will most likely require increased labor and often times materials and dollars.

In any event, history has shown that cost growth occurs as the government deviates from the perceived baseline of scope and schedule. Whether the cause is totally justifiable, or results from a combination of government procurement practice and program management, the cost growth indeed occurs.

Scoping the Program

Scope of what will actually be the

program and the workable schedule is a major ingredient in the estimation process. It is relatively easy when the program is at the funded year, the design is complete with a facility of a specified number of square feet to be built during a known period at a given location. However, when the construction is to be done two or three years in the future, the estimating challenge is more involved. Even if a significant amount of staff work has been done and there has been a strong interface among the organizations involved, the areas of uncertainty and risk in estimation increase dramatically. Increased facility/construction complexity and concurrency of weapons system development also add significant risks to both cost and schedule.

Improved Reliability of Estimates through Reserves — a Must

Three points relating to the cause for cost overruns are:

- People and their performance capability or effectiveness
- The total management system itself, and — as a product of both —
- Programs are systematically under-estimated and under budgeted.

People and the system should get priority to improve their capabilities and potentials. But actions and thrusts need to be made now to budget the most likely cost.

In the early phases, there are many areas and factors of uncertainity influencing cost. These need to be accounted for with adequate reserves included in the program budget.

Management reserves in estimating and programming for construction will go a long way to improve the cost growth picture. In putting this concept into context, it is important to think of reserves as hedges against management risks. When doing initial estimates and updates, one should keep in mind that the objective is to program the probable real cost. Risks are to be accounted for in the planning and budgeting process. It is obvious that major construction should not be estimated and programmed where there is a 50 percent probability that programs will have significant cost overruns. This is an unacceptable objective. On the other hand, if 50 percent of the programs have been overprogrammed by a significant amount, and there is no mechanism to divert or reprogram underruns, then the Air Force looses opportunity to fund other needed construction. This is also an unacceptable objective. This makes us then improve program estimates, and the acquisition process and fiscal control of program funds.

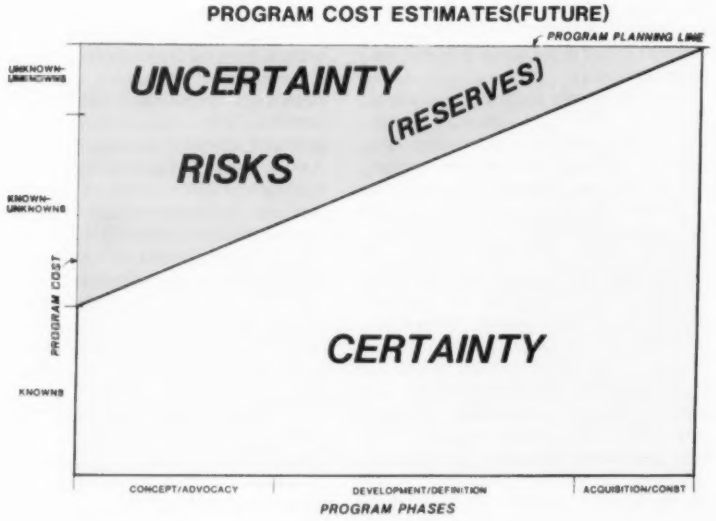
What Is Meant by Reserves?

Reserves are needed for different reasons. However, all have a common denominator — to estimate uncertainity and establish the level of management risk for cost growth.

Major Construction Program Cost Estimating - - Art or Science or Credibility?

Some people have stated that conceptual estimating of major construction is an art rather than a science. This deserves some discussion. If 50 major programs were estimated by an organization before the fact, and the estimates indeed historically turned out to be the actual cost within a reasonable amount, then the next program estimate made by the organization would probably be used in the budget process. In this case, even if the estimating technique were not understood, it "worked." Then the estimating might be assumed to be more of an art than a science. Note, that the key ingredient for influencing the budget process is credibility. Also note that an Air Force track record

Maj. Edward L. Parkinson is chief of the Construction Cost Management Group, Air Force Engineering and Services Center (AFESC/DEC), Tyndall AFB, Fla. He previously was integration manager for the Rapid Runway Repair Program within the Air Force Engineering and Services Laboratory (AFESC/RD). Before joining the E&S community, he was assigned as a weapons system program manager and systems Engineer in the AF Systems Command and the AF Logistics Command including an assignment with the F-16 SPO. A graduate of the Air Force Institute of Technology. He holds a master degree in systems engineering. He also holds a bachelor of science in industrial engineering from Arizona State University.



with the construction business for major programs has not been set.

If the Independent Cost Estimate (ICE) for a major program were simply a minor modification of the program estimate, the estimate could have credibility if it were backed up by adequate rationale. For example, backup data might show that from review of a number of similar programs, the factor reflects only a 10 percent difference between the program office estimate and what actually occurred. So, there is only a 10 percent chance of overrun in the program.

The idea of an art infers that the mechanism for developing the estimate is not understood by constituents in the decision process, and this in turn generates a perception that one estimate is not better or worse than another. This is not good. What we need is an understanding of the quantifiable elements and how they interacted to make intuition work.

Although any statistical approach includes assumptions, the key point of establishing credibility is through addressing the uncertainities and management risks.

Basic Concepts of Estimating— An Evolving Improvement Approach

Our cost estimating approach on major construction will evolve and improve over time. The first challenge after establishing appropriate organizational interfaces is to scope the most probable range of efforts and actions of what may very well happen, not merely an optimistic, hoped-for program. It is the time to think and re-think. What is missing? What is being overlooked?

Once the early planning is done in as much detail as possible, then comes the task of estimating the costs including reserves for uncertainity and risks. Consider the reliability of the basic cost estimate for each facility and support element. How much could the price vary on the bid for the basic facility? — 10 percent? — 20 percent? Are there factors that could influence cost that we have not considered? — known tight schedule? — time of year for construction? — construction management requirements? — contractor pricing climate? To cover these exigencies, a ***Bidding Reserve*** should be considered.

When construction is to be done in the uncertain "outyears" there may be many factors which could influence price:

- Perturbations of the market
- Variations in labor availability or other labor conditions

Sooner or later it always ends up in my office.

- Availability or inavailability of the materials selected.
- This is categorized as a ***Market Reserve.*** For instance, at the time of conceptualization, the market may be in a building doldrum. However, what is the cost impact if a construction increase or boom occurs during the bid year? For a given scope of construction during a specific schedule the expected cost will vary with many different factors. These ***known unknowns*** should be accounted for in the budget line item for construction.

Currently in construction estimating a five percent contingency factor is used above the basic cost estimate for the facility — a reserve to cover an unknown. But, let's look at where it came from and its adequacy for the areas discussed above. This reserve is an average of what is expected, from experience, for minor changes after contract award for a line item facility. Since this represents an average rather than a sufficient amount, this area itself is open for improvement in considering management risk. In any event, the factor was not taken from experience involving a representative sample of major programs, and obviously does not consider the many items that do occur with added complexity and interface requirements.

In addition to the ***known unknowns,*** it should be recognized that additional funding may be required, considering management risk, for things that are not accounted for in the ***known unknowns*** that relate to the very nature of major programs:

- Concurrency of facility acquisition and the weapon system being supported
- Sudden major market or labor supply problems
- A sudden scarcity of a material being used which increases cost
- Marrying the construction schedule to weapon system test and production
- Shifting the work site for tactical, strategic or scientifically related considerations requiring more site work, alteration of schedules, a different system of utility support
- Using bare base concepts instead of using an existing base or local economy for support.

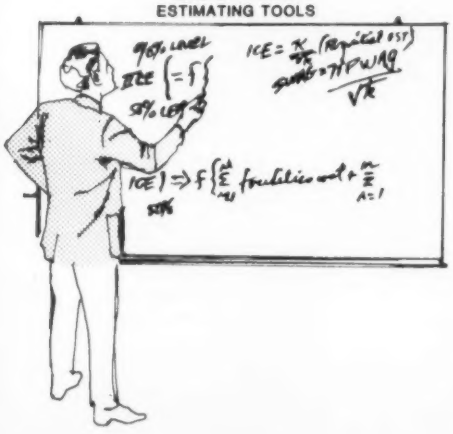
It is safe to say that some programs have a far higher probability of costly unknowns due to the very nature of the manner in which they will evolve. It is important that the potential for cost growth and management risk associated with ***unknown unknowns*** be thought through in the initial budget phase.

As discussed earlier, the need for reserves is a matter of management risk, and thus it should be planned and programmed for in the budget process. Rather than initially including all reserves in the line item budget, it may be wise to identify reserves in what can be called ***above and below the programmed line.*** The ***known unknowns*** should be included as a part of the line item budget but managed as reserve within the line item. To manage and control the reserve, it is recommended that the basic concept be to define a target baseline or budget cost excluding reserves for each line item. The AE and construction agent applicable would use this budget cost for the design effort. During the design phase, design trade-

offs or otherwise increased cost projections would have to be justified to the organization responsible for the program cost, schedule and performance. The Air Force should use a cost control mechanism similar to the Configuration Control Board (CCB) concept used on major program acquisition. Additional management reserve for the ***unknown unknowns*** could be included in the program management plans even though not in the individually funded line items. In this way, total funds projection by the program office can be reported along with the line item requirements that are being funded. The increased management reserve line would be supported through reprogramming action if and when the increased fund requirements occur.

This technique for handling management reserve on major construction has flexibility while potentially allowing more line items to be funded for other Air Force programs during the program year. It adds a measure of visibility, fiscal control and discipline needed in the program management process. Major disadvantages in this approach could occur only if major construction would become such a dominant portion of the MCP budget that the flexibility for reprogramming would not support the needs. As this approach is implemented it should be critically evaluated in the light of associated management risks and workability. A possible fall back position is to more adequately program funds within the program line item(s) similar to the method used by the Air Force Systems Command on weapon system acquisition and include added measures of fiscal and program control.

BAG OF TRICKS–
ESTIMATING TOOLS



Estimate, Report and Manage the Total Program

In a recent cost review of a major construction program, the program office within the Air Force Systems Command had been reporting a requirement for $392 million for construction. As the construction got nearer the funding years, the program estimate grew to $461 million caused by adding items and changing the scope of items. (Early estimates had not assumed that the program might require a complete base facility instead of being located on or satellited to an existing base.)

Among the lessons learned from the exercise was that much attention should be given to the update of individual line item estimates throughout the acquisition phase with the total program cost in mind. We have found that:

- Line items with higher than necessary working estimates are likely to become unnecessary cost increases.
- Line items showing a need of funds will probably become cost growth prone.

We also found reallocation of more than $60 million through improved working estimates on certain line items in the beddown could avoid cost growth on this program by taking it from the overestimated, overcushioned line items and applying it to the underestimated items.

Another key lesson is the total basing concept. Other facilities associated with this beddown outside the MCP items were not being centrally reported or managed. These included separate MCP line items for funding of family housing, schools, and for NATO infrastructure. Some of these costs have been accounted for out side the program office. However, this fragmentation results in an incredibily low estimate of what it takes to obtain operational capability. When all of the fragments fuse into a single picture at a later date, what appears to be a $392 million construction program will probably cost in the range of $1.5 billion.

Construction Management

Budgeting the most likely cost takes care of the overrun problem; however, exigencies occur that press management to accept undesirable risks of uncertainty. Therefore the push is not only to improve the estimating capability, and budget to cost, but improve the acquisition cost. Perhaps the most critical factor in getting this particular handle on cost is in the quality and capability of personnel, and secondly the construction cost management system itself. This discussion will be on the latter.

The management system for construction programs includes many layers of organizations within the government. These organization layers or levels each have interests and responsibilities regarding some aspect of the program, and they are involved time and again throughout the acquisition process. In many cases events take place during a program that make one wonder who is actually responsible and held accountable for Air Force construction programs. It is important that on major construction programs, a program manager be assigned responsibility for the cost, schedule and performance of the total effort. In addition management emphasis should be placed in the early planning stages and in obtaining a single thread of program planning and fiscal control. The appropriate organizations need to be involved early to scope the program including all knowns, ***known unknowns*** and allowing for the possibility for ***unknown unknowns.*** Many times before a program manager has even been assigned, the program has been defined with a fund profile. However, this effort for the most part is done only in a general sense, without being adequately thought through by the appropriate organizations.

When the initial estimates are made on a program, this baseline of lower level descriptive data should be kept with the program and used throughout as a building block of technical information for improving the estimates and understanding/planning for uncertainties. Improvements in these areas are desperately needed, and will be the most difficult to achieve.

There are five examples of organizational and management approaches existing in today's major programs, each offering unique opportunities and challenges for improvement itself and for evolving improvements in future programs:

- The Over-the-Horizon Backscatter Radar (OTH-B) program is using the prime contractor of the weapons system to provide the direct support facilities. A cost-type contract is being used. The AFSC/DE organization provides technical support to the program office on a matrix basis. Other base support facility requirements are being handled through the normal MCP process by the major command.

• The Travis AFB medical facility will probably be managed in the traditional approach for medical facilities. Air Force program definitions will be through the Surgeon General's office. Construction will be managed by the Air Force Regional Civil Engineer (AFRCE) with the Navy being the construction agent. A major opportunity on major medical facilities programs will be to centralize and strengthen the planning and program management to ensure adherence to cost, schedule and performance.

• The Ground Launched Cruise Missile (GLCM) system program office is a joint service SPO with the AFSC/DE organization supporting the SPO primarily for technical interface requirements associated with the NATO infrastructure. The SPO only reports on costs of the MCP. The USAFE/DE organization defines the GLCM MCP requirements.

• To support the Ballistic Missile Office (BMO) on the M-X program, the M-X AFRCE is an integral part of the BMO with the head of the organization being the deputy for facilities. This potentially allows for cost, schedule and performance responsibility for all M-X construction including technical integration of configuration with the weapon system and major command support facilities. The Corps of Engineers is the construction agent.

It is hoped that future improvements will evolve in the organizational structures particularly in total program integration planning, programming, accountability, authority and control over the construction process.

"Carlucci Initiatives"

With the new administration came a top level objective for Acquisition Improvement referred to as the Carlucci Initiatives, named after Frank C. Carlucci, Deputy Secretary of Defense. These 32 initiatives are aimed at improving cost estimating, the management system, and the overall cost picture of defense programs of which construction is a part.

Two points are in order concerning these initiatives. First, interwoven throughout all the initiatives is the concept of "decentralization" and this is good. There is a move to give more flexibility and latitude to the services to better manage their programs. The intent is to make clearer lines of responsibility and authority to the Program Manager (PM), and avoid the unnecessary reviews and involvement at higher levels. Results of decentralization can be easily misunderstood, and thus tend to weaken the overall effectiveness capability. In the government many perceive that to decentralize means to leave the program manager alone to do the job. Although it means that to a large extent, it should be understood that with decentralization of management comes increased fiscal controls and involvement by the various management levels above the PM. This added flexibility and involvement, if channelled in the right directions, can be a significant catalyst to acquisition improvement.

An Organized Approach

The discussions heading to this point in the article circumscribe a basic need. Helping in the centralized focus and support on construction cost management matters, and providing cost estimates on major programs is what motivated establishment of the Construction Cost Management Group in June 1981. This organization provides a vital link of engineering programs and responsibilities with the comptroller community and program organizations of HQ USAF and AFSC. This group provides the independent cost analysis requirements associated with the acquisition process on major weapons systems. Support will be provided to the AF/LEE organizations to help prioritize and justify MCP for upgrade and modernization of facilities. On major construction programs, the group will do sufficiency review of the POM inputs and provide periodic program assessment.

The construction process and schedule of actions will be reviewed on selected programs to help flag high risk areas and to recommend and support overall improvements. On special request, within the limits of AF/LEE delegated authority, the group will support major commands and the AFRCEs in special cost effectiveness studies and initiatives on construction management. For the future outlook, the group will seek to influence positive changes that will add the discipline and needed flexibility in the estimating and programming process. The group will work with AF/LEE organizations, MAJCOMs and AFRCEs in identifying, evaluating and implementing construction alternatives in areas ranging from specific design criteria and life cycle cost considerations to overall procurement and business strategy. The group will examine commercial construction practices and design criteria that are cost effective and useful to the Air Force. This examination must include some assessment of the specific conditions and qualifications under which these commercial practices work best.

Is it possible to delete certain specifications and save cost without significant risk of cost? Can we ask for a given quality of construction and allow the bidders to propose alternatives to achieve these goals? When should construction programs use the traditional fixed price procurement? When should strong consideration be given to the use of fixed price with incentives for improved performance? When is it wise to have a combination of cost and fixed price interacting? What can be done to improve competition and get the best final price during the negotiation process? What changes can be made to improve cost, schedule and performance control and accountability from the initial planning phases through construction completion, and with the construction agent and associated contractors? Can certain projects be used as "lead the force" to demonstrate ways to get better facilities for lower cost?

A major thrust will be taking a fresh look at what a new airbase or a upgraded airbase would look like. There must be careful consideration given to developing a realistic cost model for a base.

• When is it effective and prudent to consolidate facilities?

• What should the detached or collocated operating base of the future look like?

• What should be the policy on the use of pre-engineered buildings?

• How can airbases be laid out to optimize consideration of operations, logistics, maintenance, support functions and the quality of life experienced by the people of the base?

The group is not established as an IG, not will it function in that manner. Its role is not to police what is going on, but to earnestly seek one important capability — getting a handle on costs. The scope of challenges is immense. The tasks are relatively broad in nature to review programs for:

• Completeness
• Concurrence of the affected agencies
• Sufficiency of reserves
• Effectiveness of the concepts
• Adequacy of management provisions

Little will be done unilaterally. The group will work to assist, to solicit ideas, to ask opinions, and to seek out pitfalls, to improve the credibility, reliability and effectiveness of the planning, programming and management of construction efforts. E&S

They did their homework, experimented on base, then set out to build

ICE BRIDGES

by Maj. William M. Shanklin, Jr.

Ever hear of an ICE BRIDGE? We, at the 343rd Civil Engineering Squadron, Eielson AFB, Alaska, have not only heard of an ice bridge, but we have built them and used them.

In an ice bridge, ice is used as the construction material to span rivers and streams. Advantage is taken of the physical properties of water in its frozen state at temperatures well below the freezing point. In a nutshell, ice is thickened to the point where it will safely support vehicular loads which must travel across it. How does one go about doing this?

Don't even start unless the air temperature is well below zero Farenheit—twenty below is better. Find a suitable location for the span. Drill several holes in the ice to determine its thickness.

If the ice is thick enough to support a small grader or light dozer, the next step is removing all but one or two inches of snow. The remaining is then packed. To avoid concentrating weight, the snow should not be windrowed. A small grader or light dozer is best.

Then, holes are drilled or chopped so that the water can be pumped onto the ice where it is allowed to stand and freeze. The thickness of each layer depends on the temperature and time available between pumpings. The key to using ice for building is to make sure each layer is completely frozen, for its full thickness, before placing another layer. A six-inch layer will freeze solid in about two days at -4°F, but takes only about 12 hours at -40°F.

The Corps of Engineers' Cold Regions Research and Engineering Laboratory (CRREL) has done extensive research into ice bridge construction, primarily to support Army maneuvers. They've also compiled several "cookbooks" or pamphlets on the subject, covering determination of strong, medium, or weak ice; selection of best methods for containing the pumped water; freezing times for various thickness; insuring that the ice will safely support the maximum loads to use the bridge. Good information in the CRREL "cookbooks" became invaluable to our BCE team.

Eielson AFB provides facility support to the Blair Lakes bombing and gunnery range. There is no road into the range, which makes it accessible only by helicopter most of the year. During the winter, when the marshes and bogs are frozen, it is possible to travel there by vehicle—but only with the help of an ice bridge, and after snow has been plowed from the trail. But, during the winter of 1981-1982, the Army did not build an ice bridge across the Tanana River at a location where we could use it. Yet, we needed to get heavy construction materials, such as cement and lumber, to Blair Lakes range camp for use during the summer construction effort. That didn't stop the 343rd Civil Engineering Squadron. We did our homework, performed a few ice bridge experiments on base, then set out to build our own ice bridge.

With the help of Mother Nature temperatures of -40°F and colder finally arrived. Within a week we had constructed a series of ice bridges across the Tanana River and several sloughs, and had opened a 32-mile-long trail into the Blair Lakes camp.

One ice bridge constructed by the Air Force was 700 feet long, 200 feet wide and 48 inches thick. It easily supported at TD-25 dozer (72,000 lbs) on its way from Blair Lake range to Eielson AFB for major repairs. Essential construction materials and equipment were hauled into the range, and excess equipment was retrograded. Within a second week, the trail was blocked off and, once more, snow was allowed to pile up on the trail.

Not only was the ice bridge necessary to support the 1982 construction at the Blair Lakes range, but building an ice bridge is a valuable skill to develop for an Air Force civil engineering unit in this sub-arctic environment. In fact, it may be necessary to use these skills to support wartime air operations from frozen lakes in this part of our world.

As far as we know, this is the first ice bridge ever built by Air Force personnel.

E&S

Maj. William M. Shanklin, Jr., is the chief of operations, 343rd Civil Engineering Squadron, Eielson AFB, Alaska. He holds a bachelor's degree in civil engineering from West Virginia University and is a registered Professional Engineer in West Virginia and Pennsylvania. He is a member of the American Society of Civil Engineers and the Society of American Military Engineers. His experience includes a tour with Headquarters Aerospace Defense Command; Education-With Industry (construction) in Philadelphia; Headquarters Military Assistance Command, Vietnam; Defense Nuclear Agency at Mercury, Nev.; an exchange assignment with the Army Corps of Engineers, Colorado Springs, Colo.; and as chief engineer and commander, 554th CES, Nellis AFB.

The Challenge of Programming O&M Facilities Projects for...

FACILITIES TO SUPPORT OUR PEOPLE

by Maj. Donald R. Barrett

There are many factors which contribute to the Air Force's state of readiness. One factor is the condition of the physical plant. We in the civil engineering business, as the keepers of that physical plant, have a major role in contributing to Air Force readiness. Essential to fulfilling that role is the programming of O&M resource requirements necessary to insure the condition of our facilities contributes to and supports readiness, rather than detracting from it. One available avenue is the annual facility projects-by-contract program. This article is intended to clarify current objectives for improving Air Force facilities and reducing the backlog of maintenance and repair through increased facility project resources. An understanding of the objectives is essential to developing a facility project program that will compete well in the allocation of resources at any level.

Why is the condition of facilities important to Air Force readiness? The Air Force installation provides the launch and recovery platform for our weapon systems. Somewhat unique among the military services, the Air Force must train for and be prepared to carry out the wartime mission from our fixed bases. In order to do that, facilities such as runways, taxiways, aircraft shelters, missile silos and launch control centers, maintenance hangars and shops, as well as utility systems must be maintained in good, reliable working order. Going a step further, facilities to support our people — such as medical, housing, dining, community and recreational — must be maintained in good condition to provide for their basic needs and contribute to morale, welfare and productivity.

During FY 82 the Air Force is operating nearly 3,000 installations worldwide, including 134 major ones. The inventory of Air Force facilities, now approaching an average age of 30 years, cost approximately $18 billion to acquire. To replace the inventory at today's prices would require nearly $96 billion, excluding the price of land. With such an investment in facilities—and recognizing their importance to the Air Force mission—it makes good business sense to adequately maintain, repair, and preserve the physical plant. The O&M appropriation provides the majority of the fiscal resources expended annually for real property maintenance and repair.

A primary indicator used to evaluate the overall condition of the Air Force physical plant is the Backlog of Maintenance and Repair (BMAR). The BMAR is a measure of those maintenance and repair facility projects-by-contract which were validated and programmed for accomplishment in a prior fiscal year but which had to be deferred due to a lack of resources. The automated Civil Engineering Contract Reporting System (CECORS) transmits monthly data on most validated facility projects from base level, to the respective major command, and to Headquarters, US Air Force. (Not reported through CECORS are projects involving MWR, MCP and P341.)

Certain key data elements in the CECORS are used to identify a previously deferred, or BMAR, project. At the close of each fiscal year, BMAR identified projects are extracted from each major command's CECORS submissions, the data is consolidated and subsequently reported to the Congress. In addition, the BMAR data is used extensively at Headquarters US Air Force in justifying future year resource requirements for maintenance and repair facility projects. For these reasons, the BMAR must be accurate and credible.

The Air Force leadership and the Congress have recognized the growing problems of an aging, deteriorating physical plant and the exacerbation of the problem caused by funding shortfalls in past years. Accordingly, funding for real property maintenance was increased significantly for FY 1981 and FY 1982, most notably for maintenance and repair facility projects-by-contract. Likewise, that increased level of funding has been programmed to continue through the current Five Year Defense Plan, or the

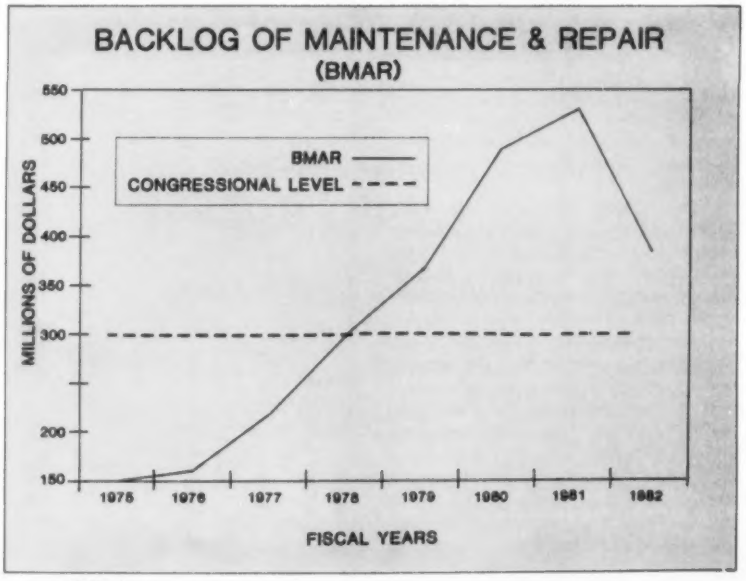


Figure 1

.FY 1983-1987 FYDP. The Congress has been a supporter also. Since FY 1978, the Congress has regularly added modest amounts of additional funding for real property maintenance and repair to the Defense Appropriations Bill. In addition, the Congress has established a BMAR Containment Policy. The Congressional policy calls for the Department of Defense to budget adequate funding in a way to insure that the BMAR does not grow beyond the amount that existed at the end of FY 1978. For the Air Force, that level is $299.9 million. The Air Force, like the other military services, has not been successful in complying with the BMAR Containment Policy. Figure 1 profiles the actual growth in the BMAR between FY 1976 and FY 1981. Also shown is the Congressional containment level.

For FY 1982 the Air Force is projecting a reduction in the BMAR for the first time since FY 1975. With the greatly increased level of funding now programmed in the FYDP, HQ USAF has established certain objectives with regard to the BMAR. First, reducing the BMAR to satisfy the Congressional Containment Policy is a priority goal. However, the more important objective is to reduce the BMAR to a manageable level before the end of the FYDP period. The manageable level, estimated at approximately $100 million, is the backlog we can reasonably expect "to live with" (i.e. it is the level at which we believe the overall physical plant condition would fully support Air Force essential mission requirements and quality of life standards). Inherent in the manageable level, of course, is the assumption that funding has been adequate to accomplish the highest priority maintenance and repair requirements such as those related to the condition of airfield pavements, utility systems, etc. Carrying forward a manageable level of backlogged projects each fiscal year also provides a baseline of requirements necessary to effectively manage and employ the engineering design work force.

Current HQ USAF objectives call for reducing the BMAR to a manageable level by the end of FY86. Based on projected maintenance and repair contract requirements, including those currently validated and reported in the CECORS, and allowing for estimated inflation, that objective appears reasonable. This assumes, of course, that the facility projects-by-contract program is actually funded at the level now programmed in the FYDP. While attainable, the BMAR manageable level objective most definitely presents a challenge. It is a challenge that we in civil engineering should relish for it provides an opportunity to reverse the deterioration of the physical plant. It is an opportunity to make an even greater contribution to Air Force readiness.

A primary reason for the focus of attention on increased funding for facility projects-by-contract has been the expanded role major commands now have in helping develop the Air Force's annual Program Objective Memorandum (POM). During November, each major command submits its own POM to HQ USAF. These major command inputs are used extensively in developing the Air Force POM. In recent years real property maintenance and repair requirements have received more favorable consideration when included as high priority initiatives in a major command POM. It is through the POM that major commands have the best opportunity to get additional facility project resources included in the FYDP (which is updated when the Air Force POM is submitted each May to the Office of the Secretary of Defense). During development of the Air Force POM, the latest available CECORS reports are used to review and validate facility project requirements included in a major command POM. The review is done on a broad resource requirement basis rather than individual line item projects. Nevertheless, it is essential that the CECORS supports major command POM initiatives requesting increased facility project funding.

To enhance the capability to program requirements in CECORS, the system was expanded in September 1981. Now base level personnel may program requirements for the current year plus six future years. This aligns CECORS programming capability with the FYDP period being considered in each year's POM. For example, in CECORS FY 1982 is now the current fiscal year and FY 1983 through FY 1988 are the six future fiscal years. This past May, the Air Force submitted the FY 1984-1988 POM to the Office of the Secretary of Defense. Figure 2 provides aggregate Air Force data showing the level of funding included in the POM for facility projects to be funded from the Operations and Maintenance Appropriation. The figure also provides actual funding obligations for FY 1978-1981 and current estimates for FY 1982 and 1983.

A substantial increase in maintenance and repair project funding occurred in FY 1981. The current estimates for both FY 1982 and 1983 sustain that increased funding for maintenance and repair facility projects. Just as significant, however, is that the Air Force leadership has programmed a large share of O&M appropriation resources for facility projects in each fiscal year through the POM period. Based on this commitment of resources, the Air Force leadership estimates the BMAR can be reduced to a manageable level by the end of FY 1986. Achieving that objective is a key factor in insuring that the

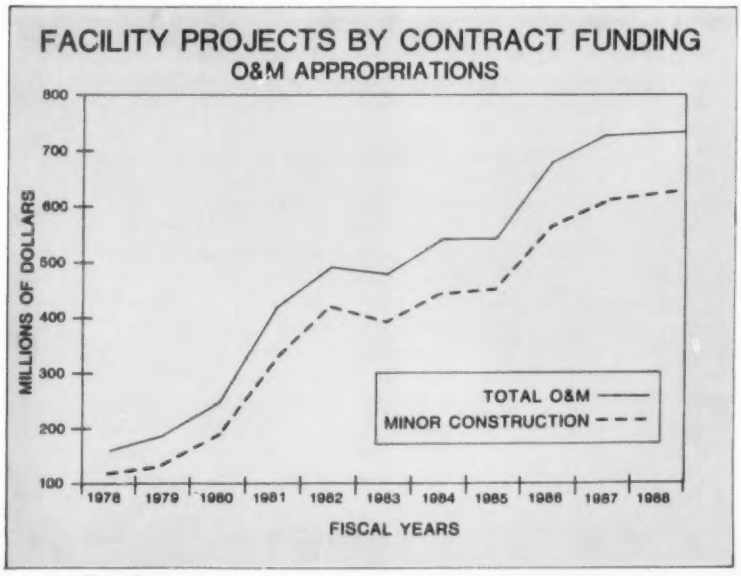


Figure 2

condition of the physical plant fully supports the Air Force mission. While reducing the BMAR is a key factor, it is not, however, the only factor considered in determining the level of resources required to adequately maintain, or preserve, the physical plant.

Recall the earlier definition of BMAR—maintenance and repair facility projects-by-contract validated and programmed for accomplishment in a prior fiscal year but which were deferred due to a lack of resources. In other words, requirements we planned to do earlier but which were not accomplished. In any particular fiscal year, these overdue requirements represent only part of the program. For example, in the current fiscal year there is a backlog of deferred requirements which should have been accomplished in previous years. However, just as importantly, new requirements have been identified which have not previously been validated and programmed. In order to determine the total requirement in developing a facility project program, the known or projected new requirements must be added to the previously deferred or BMAR requirements. It is this mix of old and new that represents the true total requirement against which available resources must be applied.

In recent years, the growth of the BMAR (Figure 1) has overshadowed the identification of new requirements. For example, the BMAR grew due to the increasing age and deterioration of Air Force facilities plus the relatively static level of funding for maintenance and repair facility projects. An increasingly disproportionate share of the constrained funding each year had to be devoted to the old, or BMAR, requirements. Efforts to identify each year's new requirements and thus to program for the true total requirement, were stagnated. In one sense, such an approach was understandable and justifiable — why devote a great deal of time and effort to developing a facility project program of total requirements when constrained resources, primarily funding, made it an exercise in futility? Nevertheless, there have been ill effects...perhaps foremost was creation of a widespread perception that the BMAR requirements in any fiscal year represented the total requirements for maintenance and repair facility projects. The problem with this perception is that when funding is increased to reduce the BMAR, some mistakenly believe this also reduces the total maintenance and repair requirement in each future year. This leads to the belief that funding in the future years could be reduced correspondingly.

Unfortunately, the above perception neglects the fact that new requirements being generated each year grow as current facilities continue to age and as the size of the physical plant increases with new facilities being constructed to accommodate new or expanding missions. Figure 3 portrays the estimated total maintenance and repair facility project requirements for each year through FY 1988. Also shown is the currently programmed maintenance and repair project funding. The shaded area between the two lines represents the projected O&M BMAR. For example, the difference between the total requirements line and the funding line for any particular fiscal year represents the projected amount of requirements that must be deferred at the close of that fiscal year. There are several other points worth noting about Figure 3. Note that as the funding increases in the early years of the period, a steady reduction in the BMAR should occur. During this time the total annual requirements should also decline despite the fact that the new requirements portion continues to grow each year. Finally, by FY 1986 the BMAR portion of the total requirements should be reduced to a manageable level and the annual new requirements should represent the predominate portion of the total annual requirements. Simply put — we should no longer be behind the euphemistic "power curve." We then should be able to concentrate on developing annual facility projects by contract programs that consist primarily of new, or current, maintenance and repair requirements rather than those previously deferred. If those programs are developed and executed properly, the relatively small amount of BMAR deferred in those future years should consist of the lowest priority requirements. In other words, this would represent a manageable level of BMAR that we can reasonably expect to live with and not detract from Air Force readiness.

Are the goals and objectives reasonable? Are the assumptions made in estimating the future requirements realistic? Is this plan nothing more than a programmer's "pie in the sky" dream? Only time will really tell...and admittedly there are many potential obstacles. The goals and objectives mentioned earlier present a real challenge. Nevertheless, the Air Force has committed to programming a significant amount of resources to halt the physical plant deterioration and insure our facilities fully support the mission and quality of life standards.

The real challenge we face is in developing a realistic, credible program of total maintenance and repair requirements and then executing the program in the most effective and efficient manner possible using the resources provided. If we succeed in that challenge, then we will fulfill our role in making sure the Air Force is ready to fly and fight.

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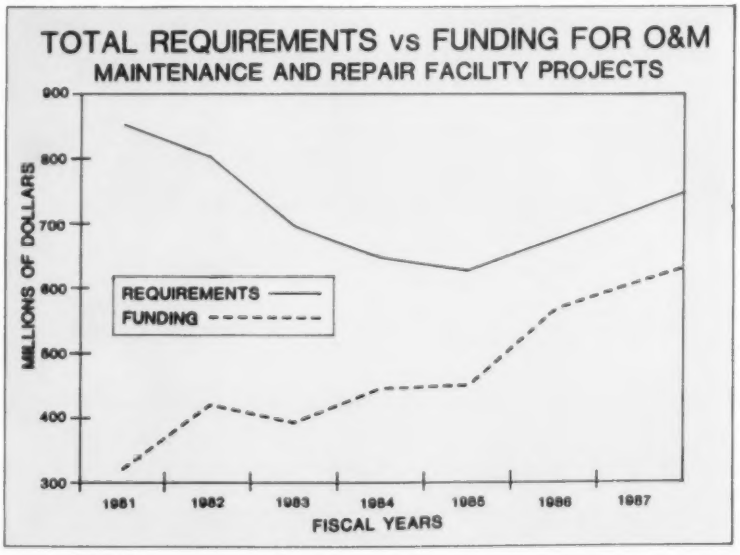


Figure 3

Current Emphasis

a brief commentary on significant developments

INTERIM GUIDANCE — RAPID RUNWAY REPAIR FOR THE RAPID DEPLOYMENT JOINT TASK FORCE — In response to the particular problems facing the RDJTF, new thought has been given to performing RRR without prepositioned materials or equipment. An interim guidance manual has been developed combining the knowledge of aircraft operations on unsurfaced airfields with the surface roughness criteria generated by the HAVE BOUNCE Research Program. The manual is available from HQ AFESC/RDCR (AFESC/RDCR, Capt. Gibbs, AUTOVON 970-6325)

FAMILY HOUSING MANAGEMENT INFORMATION SYSTEM — (FHMIS) — Headquarters Air TRaining Command has been selected as the system project office for the development of a prototype Air Force FHMIS. Completion of this effort will permit the consolidation of MAJCOM FHMIS into a standard Air Force system. Development of software is expected to begin in early FY 83. (AF/LEEHH, Mr. Sorenson, AUTOVON 227-0157)

CIVIL ENGINEERING WARTIME MANPOWER STUDY — Results of the CE Wartime Manpower Requirements and Posturing Study were presented by the Air Force Management Engineering Agency (AFMEA) to HQ USAF/LEE and HQ USAF/MPM recently. Initial results of the two-year study considered CONUS and theater wartime requirements and validated a very significant engineering wartime shortfall, seriously affecting the capability of CE to support the flying mission in the wartime theaters. Major actions agreed upon were:

a. The manpower model program developed in the study will be used to determine CE wartime requirements. This model takes into consideration theater project requirements, theater operations and maintenance, and CONUS sustaining needs to determine wartime CE requirements.

b. Peacetime manning standards will be used to determine CE strength. The rationale behind peacetime vice a wartime standard is that the wartime standard would skew the majority of authorizations heavily in favor of a small number of CE skills. The skewed manning would be unmanageable in peacetime and would not provide the flexibility needed in our military/civilian mix for meeting the CONUS sustaining requirements. The study did validate that the current peacetime CE workforce generally provides the skills required in wartime or those which can be trained in peacetime for specific wartime tasks.

c. CONUS sustaining CE requirements will be used to determine the floor for civilian to military conversion actions. Our CONUS sustaining civilian requirements were determined through an extensive study initiated in 1980. The CONUS sustaining force covers essential wartime tasks, including support of the SIOP, intra-theater airlift and essential Air Force training until relief through additional wartime contracting or overhires arrive. Initial manpower equations have been developed which identify CONUS wartime manpower requirements by base recognizing each MAJCOM's particular wartime roles.

d. FY 85 POM actions will be taken to fill deferred peacetime manpower requirements and to establish additional reserve Prime BEEF units.

These actions are most important and represent the first logical steps to ensure that civil engineering capability is available to provide rapid runway repairs, repair to bomb damaged facilities, force beddown, crash rescue and fire suppression, operations and maintenance and construction management in the wartime theater as well as sustaining the CONUS Engineering and Services wartime mission. (AFESC/DEOP, Capt. Coullahan, AUTOVON 970-6129)

A CHANGE AT THE TOP

By H. Perry Sullivan
Editor

Executive leadership of 102,000 Air Force Engineering and Services personnel worldwide changed hands in Washington when Maj. Gen. William D. Gilbert turned the reigns over to Maj. Gen. Clifton D. Wright Jr.

General Wright previously served as deputy director. General Gilbert retired after nearly four decades of service to the Air Force, four years in the director's chair, three as deputy director and more than a quarter of a century in the Washington area.

At his retirement, General Gilbert was honored with the Distinguished Service Medal for his leadership and management abilities spanning one of the most ambitious programs in the history of engineering and services. Included were major contributions to Air Force readiness, quality of life, energy conservation, reductions in maintenance and repair backlogs, upgrades to Air Force facilities, carrying out the largest military construction program in the Air Force peacetime history, improving productivity, and establishing environmental programs enabling the Air Force to carry out its mission in a way consistent with environmental law and regulation.

Readiness

He was cited for major contributions to Air Force readiness. Using this as his first priority, he spearheaded an effort to have Air Force Engineering and Services' wartime manpower requirements quantified. This resulted in the identification of shortfalls which previously were unknown. Part of the shortfall reduction he achieved was expanding Prime BEEF and beginning the Prime RIBS program to prepare services personnel for wartime missions.

To improve the quality of Prime BEEF and Prime RIBS training, he established a training site at Eglin AFB, Fla., through which 8,000 trainees per year gain hands-on experience in contingency skills. Another initiative was providing training to Air Force Commissary Service personnel in their wartime responsibilities for troop issue and field exchanges.

He also started bringing contracted food service operations back to military manning to establish a wartime surge capability.

With the growth of strategic importance in Southwest Asia, almost matched by increasing instability there, the development of a rapid deployment force gained new momentum. General Gilbert spearheaded an effort to get Air Force supporting facilities constructed.

One need in Europe was heavy repair capability. General Gilbert pre-positioned a RED HORSE squadron in Europe with its full compliment of equipment to curtail the need for vital airlift and avoid dependence upon the slower sealift mode.

As strategists unfolded a potential conventional war in Europe, the possibility of an ***iron-bomb*** war emerged with the likelihood of heavy bomb damage to base facilities and response forces hampered by chamical, biological and radiological agents. General Gilbert initiated a program to improve repair times on runways and hardstand, explored alternative take-off surfaces, and measure the effects on the aircraft operating from roughly repaired surfaces.

In any encounter, the quality of aircraft shelters is of paramount importance in operating theaters. General Gilbert was responsible for carrying out a major portion of the Aircraft Shelter Building Program. He also initiated a scientific inquiry into shelter systems, testing their capabilities to protect aircraft from damage during an attack, and to protect other aircraft from damage in the event of an explosive mishap within a shelter.

Major Construction Programs

While the readiness initiatives were underway, General Gilbert was carrying out an extensive military construction program, including some of the biggest major projects in Air Force history.

Among them was the $1.07 billion Israeli Air Base Construction Program, tied to the Camp David peace accords between Egypt and Israel. Two bases were built to support Israeli tactical air forces replacing bases in the Sinai desert which they gave up as part of the peace agreement. As executive program officer for the Department of Defense, General Gilbert welded together a team of Air Force managers, Army Corps of Engineers construction agents, U.S. contractors and some 8,500 workers to get the job done on time – at the lowest possible cost – resolving management problems within the organizational structure he established. His initiatives in cost management and budget reviews were credited with keeping the program dollars within reasonable expectations, even in the face of numerous program changes. He established a credibility with the Israeli government which made timely and cost-effective completion possible.

Other programs being carried out at the same time included the Space Shuttle facility at Vandenberg AFB, Calif.; the test facility for high-altitude air-breathing engines at Arnold AFS, Tenn.; support to Strategic Air Command and the Air Launched Cruise Missile; initiation of the Ground-Launch Cruise Missile beddown; and aggressively carrying out a program to provide basing the beddown alternatives to senior leadership on the M-X missile system.

One of the key programs he initiated was creating a special office to oversee the cost of engineering construction programs – including estimating the size and scope of programs, adequacy of funding including reserves and searching for more mission or cost-effective alternatives.

He also worked with the Army Corps of Engineers and the Naval Facilities Engineering Command to improve funds control and contract management. General Gilbert also established a system of cost limitations to reduce project costs and increase the amount of quality of construction possible from the funds allocated.

Quality of Life

Under General Gilbert's leadership, improved dormitories for nearly 25,000 enlisted personnel were included in FY 78-81 budgets. They totalled $180 million, which by FY 87 will reach $205 million per year; a total improvement of the dormitory inventory to new construction standards should be reached by FY 89. He also forwarded a plan to improve family housing, constructing 1,560 overseas units and acquiring 1,000. Acquisition of the latter saved $80 million in new construction costs. General Gilbert also provided Congress the arguments supporting upgrades to the liveability and energy efficiency of 60,000 houses in the existing inventory. A major breakthrough was funding for transient quarters, upgrading them to commercially acceptable standards.

As chairman of the board of directors for the Air Force Commissary Service, General Gilbert was instrumental in directing a $240 million commissary re-building and modernization program. There are 141 U.S. Air Force commissaries with annual sales totalling $2 billion world-wide.

General Gilbert took particular pride in the efforts to upgrade dining facilities, both in terms of service for those utilizing dining halls and improved management methods to insure top quality food service at lower cost. He was instrumental in Air Force-wide implementation of the a la carte food service system. So successful was he, that the General Accounting Of-

Credibility

If there is a single word most often repeated about the tenure of Maj. Gen. William D. Gilbert as Air Force Director of Engineering and Services, it is "credibility."

His legacy will be his unique abilities to carry out an ambitious program for facilities, vigorously attacking backlogs in maintenance and repair, while keeping rapport with the senior leadership of the Air Force, DOD and the Congress.

He is one of the few to rise to the lofty heights of the directorship from the enlisted combat engineering ranks of World War II. He also has the distinction of being the only personnel officer, academically trained in management, to become the top engineer in the Air Force.

If there are milestones in basically a typical career which bear mentioning, they are:

• **Executive to Maj. Gen. Guy H. Goddard.** – Harry Rietman, associate director for Engineering and Services (who joined the Pentagon staff in 1957) remembers General Gilbert as a person with a nearly photographic memory for projects – where they were, their latest developments, next action required, what the Director was last informed on and who needed to be brought up to speed.

"Phenomenal," was his ability to track each of the hundreds of line items of importance at any time. The often tedious, demanding task of negotiating a requirement through the bureaucratic maze and onto the legislative level, is an education process – a character shaping experience.

General Gilbert acquired two habits – knowing people, the people he worked for, with and those who worked for him; and developed the knack of tracking numerous items at one time.

In later years, James Boatright, deputy assistant Secretary of the Air Force for Installations, said, "He seemed to handle 1,000 issues all at once and at a pace which few could follow."

• **Commander, Air Force Civil Engineering Center, Wright-Patterson AFB, Ohio** – When the decision was made to move the engineering center and laboratory from Wright-Patterson to Tyndall AFB, Fla., General Gilbert systematically set about making sure that the move would work.

Part of the challenge was to make the move with as many key personnel intact as possible. What few realized at the time was that this was but the beginning chapter of a long-term plan. General Gilbert did not make the move to Florida. Instead, he went to Military Airlift Command as the deputy chief of staff for Civil Engineering to Gen. Jack J. Catton.

In later years, it was General Gilbert, as deputy to Maj. Gen. Robert C. Thompson, who pleaded the case for a true engineering and services center at Tyndall – including the management of the Engineering laboratory.

• **Deputy chief of staff for Civil Engineering (later, Engineering and Services) Pacific Air Forces** – General Gilbert is given credit for turning PACAF around from an almost depressed mental state in the wake of cutbacks necessitated by the end of the Vietnam conflict. The result was made PACAF an essential force in the stability of the Pacific. He developed a 26,000-space dormitory upgrade program, with a $42 million investment and an impressive array of resources – RED HORSE, contractors, in-house base civil engineering forces and self-help. He initiated a companion dining hall improvement program and put 1,250 new units of family housing under an estimated $43 million for contract and design. In the nonappropriated area he upgraded morale, welfare and recreation facilities throughout the command with an estimated $10 million worth of bowling centers, clubs and recreational shops.

When the energy crisis hit in 1973-74,

fice, the Department of Defense and the Defense Audit Service have recommended it for other services. Working with the Army's Natick Laboratories, General Gilbert gave personal interest and support to the development of the Automated Food Service Operation System, which gives food service managers the computerized management tools necessary to make their time more productive in terms of real food quality, service and meal planning with less time spent on bookkeeping and forms.

One of the general's key initiatives was to bring computerized billeting management into the Air Force. He initiated programs to get commercially available hardware adapted to Air Force billeting needs, greatly expediting check-in and check-out procedures, improving overall management and making more customer service time available.

Education and Training

With the directorship comes the added responsibility for serving as the permanent overseer of the program review committees which guide and advise the Air Training Command elements which support Air Force Engineering and Services on a worldwide level.

General Gilbert made major initiatives to insure the responsiveness of the training community to the needs of Air Force commanders and their engineering and services missions. This included working with the technical training center communities to insure the appropriateness of their efforts, constant revision and re-structuring of the curriculum at the Air Force Institute of Technology's School of Civil Engineering, and participating with other Air Force elements to increase the availability of engineering and scientific officers.

Civilian Career Development

General Gilbert worked directly with the Office of Civilian Personnel Operations and the deputy chief of staff for Manpower and Personnel to insure an appropriate civilian career development program meeting the needs of the 7,000 civilians primarily affected by it. It marks the first time that a comprehensive training, development and promotion system has been available to the civil engineering and services career fields.

he over-subscribed goals for energy consumption cuts in PACAF by double, achieving a 28 percent reduction over the year previous to the crisis. This put PACAF on a programmed energy conservation plan. Faced with high costs to retain excess facilities, he systematically identified mission-essential facilities and disposed of, or ***pickled,*** the remainder. At the same time, he leap-frogged from a syndrome of late development in each year's Facilities-by-Contract Program to a position of being ready to obligate when the money was first available. He sifted through some $33 million in relocatable assets in Thailand, and systematically began programming these against needs which would otherwise be costly new starts. He reallocated some $6 million worth in one year.

Among the biggest challenges in his career was the overnight requirement to establish centers for the returning personnel from Vietnam and Southeast Asian refugees. Tent cities were established with field hospitals at Clark AB, The Philippines, and Wake Island. Military and contractor personnel were put to work. Rations, supplies, housekeeping items, personnel maintenance needs and essential utilities were made available.

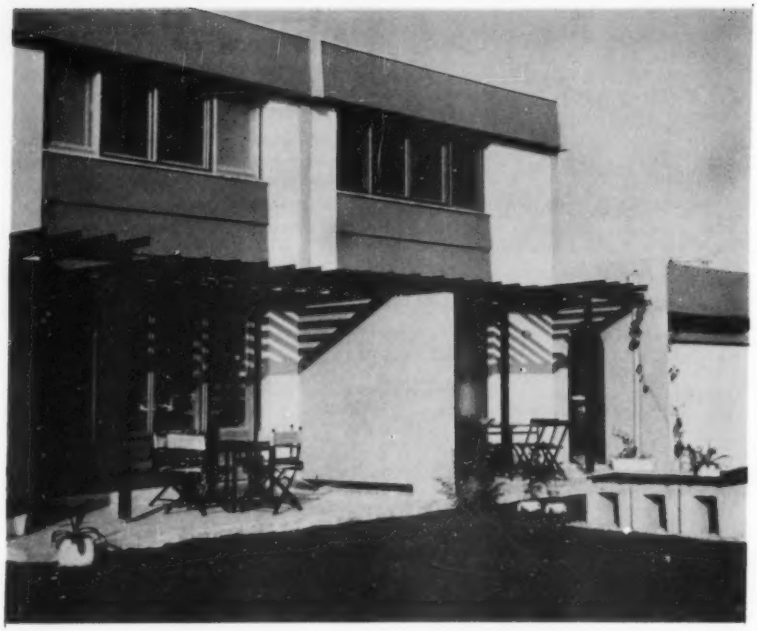
Among his innovations was fusing "things related to people" under one deputate, ***"Engineering and Services."***

These achievements made General Thompson's quest for a deputy in Washington an easy choice. General Thompson told a member of his staff (who had been with General Thompson during his own creative years in Europe) that the new deputy director had an unparallelled commitment to readiness and an equally deep commitment to people.

• **Deputy director, Civilian Engineering (later Engineering and Services)** — The person General Thompson moved into the number two slot had unique qualities. He rarely used "$1.98 words" when simple words sufficed. He didn't duck issues. He didn't drop projects or sidestep controversy. While General Thompson chose the role of relating to the senior Air Force leadership and DOD, the deputy was sent "over to the Hill," before committees, staffs and the process of defending the budget.

When General Thompson elected to retire, his successor had been fire-formed in the most difficult forge in government.

When General Gilbert moved up, several dynamics kept him heavily engaged with the leadership. First, the decision was made to create the center at Tyndall under the command of a brigadier general. First commander of the center was Brig. Gen. Clifton D. Wright Jr., who also held the title of deputy director. This demanding task of creating a totally new relationship "offline" at Tyndall was a significant challenge.



Whenever USAFE needed a two-star action officer in Washington, we could count on General Gilbert to respond — and it didn't take a command section "zinger," either. Without his strong backing and personal involvement, our Incirlik family housing construction program wouldn't be where it is today (Photos Model 50 Fast Track). He personally carried the flag for the USAFE NCO Leadership School that made the ribbon-cutting a reality on Aug. 26, 1982. During his "watch," General Gilbert always kept our Air Force people and their mission first and foremost. (Brig. Gen. Sheldon J. Lustig, Deputy Chief of Staff, U.S. Air Forces in Europe.)

This left General Gilbert to continue many of the tasks formerly identified to the deputy director. "In my view he did as fine a job as any past director," recalls Boatright. "He articulated Air Force needs to the senior leadership. Budget levels for real property maintenance and the military construction program rose dramatically. His efforts to reduce facilities maintenance backlogs were based on the argument that you either do something now or pay dearly in 10 to 15 years. That was never done before."

It was a persuasive argument.

"Part of his credibility was his forceful manner," said Boatright. "His presentations to the Congress on our programs were unparallelled — a tremendous job."

Maj. Gen. T.D. Broadwater, director for Logistics, Plans and Programs said, "There have been many occasions when I have entered the Air Staff Board primed to fight for essential logistics programs, but worried about the outcome...(General Gilbert's) strong, articulate, reasoned support greatly benefited Air Force readiness. The programming of resources for our rapid deployment forces was just one example. We've also made headway in increasing and balancing our wartime logistics. That balanced approach also considered the essential support provided to our airmen and their families."

Another member of the deputy chief of staff's office, Maj. Gen. Martin C. Fulcher (assistant to the deputy chief of staff, Logistics and Engineering) said, "Our bases are in better shape than at any time in Air Force history. The quality of life on our bases is much improved and is unmatched by any of the other military services. Our installations are functioning in harmony with their surrounding neighbors."

Retiring vice commander of Air Force Engineering and Services Center at Tyndall, Col. John L. Perry, noted that General Gilbert will always be remembered for making services a full member of the Air Force Engineering and Services team.

More than anyone, General "Bill" Gilbert is the man who made it obvious to the senior Air Force and DOD leadership that the people of engineering and services should be invited to the next war; that if we intend to win any future conflict, the nation needs engineering and services support now.

Gen. Wright Takes Reins

By H. Perry Sullivan
Editor

During the ***years of change*** in Europe, when the nature of Air Force Engineering and Services was being re-shaped by the late Maj. Gen. Robert C. Thompson, then deputy chief of staff, Civil Engineering, U.S. Air Forces in Europe, the project officer in charge of changing things was frequently a young colonel just assigned to Lindsey AS, Germany, as the director of operations and maintenance.

In the years to follow there would be numerous challenges – increasing the readiness of the engineering forces in Europe; major construction programs to harden and protect our bases and their aircraft; improvements to base housing, commissaries and exchanges; marrying up the engineering and services functions; and relocating the headquarters to Ramstein AB.

In three years at U.S. Armed Forces in Europe (USAFE), Col. Clifton D. Wright moved to become assistant deputy chief of staff for Engineering and Services. When he became the new DCS/DE at Strategic Air Command, he was on the ground floor of change as SAC dealt first with the potential advent of the B-1, the possibility of a new strategic missile and an over-riding need to improve the quality of life available to its forces. There were also the challenges of keeping old facilities going and adapting missile silos to new equipment, keeping SAC ready for its wartime mission.

He was on familiar ground. Early in his career, soon after graduation from Clemson University with a degree in architectural engineering, he was made chief of the contract inspection section at the 374th Installations Squadron, Tachikawa AB, Japan, later moving up to the chief of the engineering and construction branch – as a lieuntenant. Two years later he was assigned to the Air Force Ballistic Missile Division, Camp Cooke, Calif. (now Vandenberg AFB). There he was base deputy civil engineer during the early phases of development of the base, moving to project officer for the Capehart housing construction, Tyndall AFB, Fla., eventually becoming the Atlas weapons system project officer.

Moving about the Air Force with new assignments was nothing new to "Duke" Wright. He grew up on military installations – Langley AFB, Va.; Ft. McClellan, Ala.; Wiesbaden AB, Germany; and Eglin AFB, Fla.

His assignments after California included San Vito AS, Italy; Manzano Base, N.M.; Vietnam; Sandia Base, N.M.; and educational assignments to Air Command and Staff College, Maxwell AFB, Ala., and the Industrial College of the Armed Forces, Ft. Lesley J. McNair, Washington, D.C.

One of his most significant assignments came following his tour with SAC. He was chosen to be the first commander of the new Air Force Engineering and Services Center, Tyndall AFB, Fla. Throughout the formative period of an engineering and services function there was the problem of scattered responsibilities. ***Things related to people,*** for instance came under many different agencies. At one time, there were five different commands responsible for what engineering and services now encompasses.

First came the Air Force Engineering and Services Agency, commanded by the director. This achieved the goal of extracting from various elements of the Air Force those things which must be aggregated to form an effective organization. Then came the center, headed by the deputy director.

General Wright welded together Operations and Maintenance, Readiness, Fire Fighting, Environmental, Energy, Housing and Services directorates with the laboratory function – Research and Development. Demands upon the center reflected the changing world scene – politically and technologically. The center spearheaded an effort to upgrade an Egyptian airfield, including installation of runway barriers and arresting systems. An energy assistance team was formed to aid field activities in saving energy, ultimately helping to save $40 million in 1979. Landing sites for the NASA Space Shuttle were surveyed and evaluated. A training site was established at Eglin AFB, Fla., for both base emergency engineering forces and the services forces committed to readiness response.

A new memorandum of understanding with the Air Force Systems Command consolidated research for civil engineering, environics and personnel support at one facility.

When the decision was made to return the deputy director's position to Washington, General Wright soon became the right hand of the director, picking up the responsibility of advocating the Air Force needs of today and the future before the Air Staff, DOD and the Congress. He was chosen for promotion to the grade of major general.

His predecessor put it plainly, "I have the added pleasure of knowing that I leave the organization and its people in good capable hands."

Interview

An interview with Col. Joseph A. (Bud) Ahearn, "good shepherd" to the E&S POM.

There is a general rule in the Pentagon that is noteworthy. The rule is

"if it ain't in the POM it ain't in the budget"

ESQ: What is the POM?

COL. AHEARN: The POM by definition is the Program Objective Memorandum. In it we program over five years the needed resources to fulfill our missions. There is one essentiality that must precede programming and that is good planning. Secondly the POM is the stepping stone to the budget. There is a general rule in the Pentagon that is noteworthy. The rule is"if it ain't in the POM it ain't in the budget."

ESQ: What are the phases of the POM process?

COL. AHEARN: The POM process is continuous. There is a schedule and we follow it rigorously here in the Pentagon and in the major commands. If we miss the train we miss the opportunity to advocate for our needed resources. The Air Force in early May submitted its '84-88 POM to the Secretary of Defense. After the Secretary of Defense makes his POM decisions the major commands renew the cycle. The major command commander knows what was successful in the POM and what wasn't. He and his staff reevaluate their priorities and initiatives and start the building process again for POM '85-89. Early in the fall the panels that are part and parcel of the Air Force Board structure begin reviewing the MAJCOM initiatives. The panel calls for detailed major command briefings on their major initiatives. These are two phase points that we really hold to -the late fall major command submittal, and the on going debate through the Air Force Board structure between late fall and May. It gets pretty testy in the debate.

ESQ: Has this changed in the past few years?

COL. AHEARN: The process has changed a great deal. I think that the major change has occurred in the way that the Air Staff does business with the major commands. The major commands, up until about two years ago, submitted their POM but the decision making was done in the Pentagon board rooms without a lot of counsel from the very major commands which submitted the programs. A couple of years ago we decided to open up the debating process — the purging process — to all the major commands to make sure that there was more participation and to make sure that we made better judgements. That process change is referred to as the "open POM." We opened the doors to the commanders and senior planners of the major commands. We believe that that process has significantly improved the investment balance across the Air Force.

ESQ: How have we in Engineering and Services done?

COL. AHEARN: We've done remarkably better because we've involved the major command commanders who understand full well the mission contributions of Engineering and Services. As commanders they have a deeper sensitivity than other more traditional functional leaders. They understand that the first priority of the Air Force is people. Each understand full well the contribution of Engineering and Services makes in building and maintaining the morale and welfare of his people. If you want to express this quantitatively I believe that the growth has been between 300 and 400 percent since involving the major command commander in the POM process.

ESQ: If we are going to involve the major force commander in the POM process doesn't it involve a unique challenge for the field level activities?

COL. AHEARN: It does. For the MAJCOM the first challenge is to know better than anyone else the compelling requirements of field level units. The second challenge is to open their perspective beyond that of the major command so as to include in their perspective the priorities of the Air Force on an international or global basis. Some commands are oriented that way by their very mission—AFLC and AFSC, for instance. The put and take in the debate process can be quite difficult. But with the full understanding by the commander of what the Air Force priorities are and the contribution of each of his activities, then things line up very well.

ESQ: What should our people be doing? Is the POM a one-year-at-a-time process, or should we be looking down the road five years constantly?

COL. AHEARN: The POM is really near-term planning. It is the expression of resources required to fulfill well developed plans. It takes at least three years to bring a good military construction program on line, and the

same for military housing. The time is required for planning and design, and finally the construction. So, when one looks at the POM process, look down the road. Look for steady growth in the investment. Look to setting good growth targets for base modernization. Actually we have just over $7 billion worth of validated modernization requirements right now and we have set a growing investment line targeted to cut down that backlog.

ESQ: Does the Air Force set the priorities structure for its POM?

COL. AHEARN: Very much so. The leadership does this as much in deed as they do in principle. The first priority is people—all that it takes to annually recruit, train, equip, motivate, and retain people. For us this translates into providing our people competitive salaries and decent places to work and live. There is a personnel activity panel that dedicates itself to advising the board structure on things ***people.*** It is probably one of the most exciting and most capable groups of people we have on the Air Staff. That group certainly holds the respect of the major commands. The second priority that we stress very heavily is the strategic program. Here we look at the priority of the weapon systems. The strategic nuclear capability is our very first priority for weapon systems. Readiness and sustainability investments are our third priority. Improving the rapid deployment capability through an expanded airlift capability and through an expanded Southwest Asia basing network are examples of our third priority. Adding refueling capability and prepositioning selected materials are examples of our fourth priority. And finally modernizing our tactical air forces fills out our general priority list.

ESQ: What is the advocacy process?

COL. AHEARN: The major command is expected to be the strongest advocate for initiatives and resources. In the board structure we marry up every major command with a panel. For example strategic defense requirements for ADCOM are carefully reviewed and then advocated by the strategic defense panel. Likewise, there is a strategic offense panel lined up with the Strategic Air Command. The panels are expected to review in detail, and to know the priorities of the major command and how they relate to the priorities of the Air Force. After the requirements expressed by the major command have been scrubbed very, very carefully—really with a wire brush—the panel is expected to decide what they want to endorse. And then they become advocates. And so what we have here is a role transfer. The panel leader then goes to the Program Review Committee—the PRC—which is the second tier in the Air Force Board structure and they advocate the major command's requirements and its contribution to the Air Force.

ESQ: What is the scope of the PRC?

COL. AHEARN: The PRC hears all of the panel presentations— mobility, strategic defense, support forces, personnel, etc. Then the presentations of the panels are consolidated into the Air Force "first cut," integrating the priorities of the commands. The PRC is headed up by a brigadier general and very senior colonels and very experienced senior civilian executives. After they make their judgement, they take it to the Air Force Board, headed by a major general. The vast majority of the board's members are major generals. And that group reviews how well all of the investment lines are contributing to the system of priorities. The Chief of Staff and the three-star DCSs then review the recommendations for the Air Force Board. We're still not done. The Secretary of the Air Force and his senior staff then review the Air Staff position. Finally we decide this is what the Air Force stands for! Well, we're still not done. We take the Air Force POM and move it forward into the Defense Department's Defense Review Board (DRB). This group initiates this whole process very early in the game by sending the defense guidance for the POM. The defense guidance helps us set our priorities. The DRB reviews the service POMS for compliance with this guidance and issue their decisions in the form of program decision memoranda. We've visited four or five levels of bureauacracy and we've still got to go to the Congress. The Congress has their priorities which are sometimes different from the priorities set by the Defense Department. Their priorities essentially may be those of their publics — their constituencies. Sometimes there is a little disagreement on what is most important or on how to go about doing something. One thing for sure, this maze provides a real test of the validity for your requirements.

ESQ: What is the primary value to the nation derived from the process of shaking down the POM?

COL. AHEARN: I think that the most significant value is the test of authenticity of what the requirement contributes to the national defense.

ESQ: Does it force us to better integrate our requirements under the priorities and programs that we have established?

COL. AHEARN: Very, very much so. It forces us to be disciplined. It forces us to be balanced—in terms of conventional versus nuclear; in terms of strategic offense and defense; in terms of tactical forces. When you seek out a weapon system it drives you to programming complete costs—the training and tech schools, the equipment, the logistics support, and the product. The piece of hardware is usually the focal point, but all of the support elements are terribly important in the success of any piece of hardware. All too often we tend to focus on the hardware. What the POM does is force you to focus on the total.

ESQ: In the past we have identified requirements which were minimally stated in the context of what eventually became the total project. Are we doing anything about this?

COL. AHEARN: Stating the total requirement has always been our objective, to the best of my knowledge. We are careful to build a program versus a project. When I say program, I have in mind an undertaking that would require one or more projects over an extended period of time. The acquisition of facilities to beddown the ground launched cruise missile (GLCM) in an operational mode is a facilities program that needs a great deal of lead time for bringing on people, equipping them, training them and bedding them down. So, in a program like GLCM we have the Air Training Command, the Logistics Command, the Systems Command, the Tactical Air Command, and USAFE, all very much involved.

Col. Joseph A. (Bud) Ahearn is the chief of the Programming Division in the Air Force Directorate of Engineering and Services. A 1958 graduate of the University of Notre Dame, he holds a bachelor of science degree in civil engineering. His master's degree in engineering management was obtained through the Air Force Institute of Technology, University of Syracuse. His assignments have been with Headquarters 8th Air Force, Strategic Air Command, Security Service in European Theatre, PACAF, Air Training Command and the Air Staff. Colonel Ahearn has written three articles for the ***Quarterly*** *and has been a frequent guest lecturer at the Leadership and Management Development Center and the School of Civil Engineering School, AFIT.*

What we have then is an array of facilities among the various commands reflecting the unique contribution of each to that program. It's no easy task as you go through each of the program reviews to say that you know all the requirements. Sometimes as the weapon systems go through the phases of the development the facility requirements change for hardware and people. As programs go through the development process there are ***known unknowns,*** and we've got to become a little more clever on how we declare our total program cost. As we are conditioned to deal with the changing economy, world political factors, natural disasters, changes in the values of currency on the world's exchanges, runaway inflation—the kind of things that can occur over the span of a multi-year program we must look to placing in the program a management reserve of funds to accommodate ***known unknowns.*** We must do better at expressing what the program is really going to cost.

ESQ: Do we teach the POM process in any way?

COL. AHEARN: No. We introduce it in a cursory way in the Air Force Institute of Technology over in the Civil Engineering School. It's a part of the language of the programming process. But, it is not a curriculum item.

ESQ: How do we communicate essential information about the POM to the people at MAJCOM and field level?

COL. AHEARN: The POM is really the instrument of the planning and programming element of the Air Force. We're but one of the functional players. It is worked through the DCS Plans at the major commands. They are the OPR and they put out guidance on a regular basis.

ESQ: Is there a dollar ceiling expressed in the POM guidance on how much the Air Force can expect to get each year?

COL. AHEARN: Yes. There is a limit. The precise expression of a ceiling has been given to us in the form of targets which we have come to respect. But a target is not considered by a good programmer to be a cap. A good programmer who feels that he has a hard-hitting initiative would not be constrained by the cap. But we know that the economic conditions prevailing throughout our nation tell us how much we can afford and what our limits should be. We respect the debate process and the only absolute decisions for us are those of the Secretary of Defense, and for him the wishes of the President and the Congress.

ESQ: How do base modernization, upgrading and replacement of substandard facilities fit into the POM?

COL. AHEARN: These are expressed best by the major commands in their POM particularly the funded elements of the BOS. The Air Force and the Defense Department leadership pays attention to initiatives provided by the MAJCOMS. Base modernization is an awfully high priority of our business. It

is also important to our major command commanders. Much of our base inventory is 35 years old. Much of it has worn out. A few years ago we identified about $7-10 billion of facilities which require replacement. We made a major issue out of base modernization. And the leadership bought the reduction of that huge backlog and it is programmed down to about $2 billion by 1989.

ESQ: What's the Air Force doing about family housing? Does family housing play in the POM?

COL. AHEARN: It plays huge in the POM. It plays with the first priority of the Air Force, taking care of its people. It was very big this year in the '84 POM wherein we have established a new initiative. We think that we have got about 20,000 units of new family housing that we need in the inventory. We also have a $4 billion improvement program to update the 140,000 housing units that we do have in our inventory. The Air Force leadership decided to fund half of the new requirements for the next five years. This means funding the most sorely needed—about 2,000 units per year—and then take care of the improvement program completely during this same five years. There is a very, very significant investment in family housing.

ESQ: Has there been a shift in the housing program?

COL. AHEARN: Yes. The shift, as I see it, has been in the way that we are pursuing the recognition of the need, pursuing the resource. There was a period in the mid-70s when we bought little family housing.

ESQ: Are there any other areas involving people programs which are competing within the POM?

COL. AHEARN: We believe that being good stewards of the facilities account, is probably as important a thing as we will ever do. We operate and maintain the existing facilities we have on the base with our real property maintenance account. Our folks at base level are proud that they belong to that base and that community. They want the base well maintained. And so I would say that the real property maintenance account in the POM plays very, very large in terms of people. It is important to keep things looking well maintained and keep the utility systems on line, making sure that the heating and cooling are reliable. That's not necessarily an engineer's perspective. That's a leader's perspective. You want things which operate well and are maintained well. It gets to how your people feel about themselves, their base, and their community. The second thing that we are working is in the hospital programs. We have a huge investment program—starting with more than $100 million in '82 to more than $300 million in the last year of the''88 POM to upgrade the facilities to the modern practice of medicine. The Air Force is the pacesetter in the Department of Defense for dormitories, and has been for a long time. We will have fixed 90,000 spaces of dormitory inventory when we finish

POM year '88. For about eight years we have worked to bring up to date what heretofore were old barracks and turn them into modern dormitories.

ESQ: There are many categorical programs which we have been selling to our managers and to our people for many years—and these include energy, reliability, pollution abatement and occupational safety. Do these get any consideration in the POM?

COL. AHEARN: Oh, a great deal. If we could talk about energy first. Energy is a good investment in terms of dollars and cents when it amortizes in four to six years. Improved reliability and maintainability are also good business when we extend the service life of our facilities and their systems. It's the kind of investment that requires some special leadership from civil engineers. And it also gets some special care from our comptroller world. They are interested in lowering the operating cost of our airbases. So we seek an alliance with the comptrollers when we go to market our energy and reliability programs. The Occupational Safety and Health Act requires us to safeguard the people who are working and living on our airbases. The vast majority of the investment in protecting our people is done in the O&M account. However we do some very special projects, particularly in the industrial facilities where there are involved complex, high risk and high value processes, such as at the logistics centers. Pollution is an area where there are statutes. There are also enforcers of those statutes who get out and police the armed services. Certainly we will make the investment to comply in any area in which there may be a citation or a charge that we violate the law.

ESQ: Is there an economic analysis required on cost benefits derived from renewal programs?

COL. AHEARN: We measure projects against two questions. The first is "What does it contribute to airpower?" The second is "What does it contribute to the productivity of the Air Force workforce?" Now when we look at the laboratory facilities of the Systems Command, or the depot facilities of the Logistics Command, or the Air Training Command facilities, or the maintenance facilities of TAC, SAC, USAFE, and PACAF, there are many industrial productivity oriented functions out there housed in facilities which are 25 to 50 years old. You know very well that the facilities are out of phase with the times. When we marry up the modernization of our facilities with the functions on line quite often there is some tremendous efficiency improvement. While we don't call for an economic analysis for every project, when these efficiencies are readily apparent they ought to be quantified as a point of emphasis and for a point of argument in the advocacy of the project. We ask the question, "What does it do for productivity?" on almost every project in

modernization. Economic analysis helps a great deal when answering that question. Some modernization requirements are intuitively obvious, such as when you're living out of World War II temporary mobilization facilities. But when you look at our industrial facilities it often isn't intuitively obvious because you don't see the the process, the support network, the utility systems. Economic analysis is a good way to draw the attention of people to the facilities that need fixing.

ESQ: Let's imagine three individuals one each at base, major command and at Air Staff levels. What is the best advice you can give those people to help them identify, validate and state their needs?

COL. AHEARN: At the base of MAJCOM level I think the most significant event that can occur is the development of a good base development plan and a good five year investment plan. I'm talking about the line items for construction, real property maintenance, family housing maintenance, improvements and construction. Lay out those investment lines for the people who will follow you. After all, most engineers are working somebody else's long term program. Collectively, we must have a vision of the future. Make that vision work with coherent, comprehensive, and consistent plans. Make your money programs follow those base plans. That way there are milestones for everyone. From the Air Staff point of view the most important thing is to become a trusted participant in the Air Force Board structure. An officer here has got to be believable; he's got to know what he's talking about; he's got to know the priorities of the Air Force as well as Engineering and Services. He's got to be unwavering in his commitment to Air Force priorities, and especially to those priorities affecting our people. We have to advocate strongly for the people programs. I really believe though that the business of being a strong credible advocate for the major command and his Engineering and Services functions is the first priority of the Air Staff. That's where I put my time and energies. I try to be an extension of the commands and to know well their missions and requirements.

ESQ: If you had to recommend courses or academic programs for our people in Engineering and Services to better enable them to deal with the processes of the POM, which would they be?

COL. AHEARN: At the outset I said that the POM is the expression of the resources to fulfill the mission in the Air Force. Therefore the first priority is to know Air Force doctrine and the mission of the Air Force. And that leads to the professional military education process in all of its forms. That's where we find out that air power is people power, and become versed in the strong elements of a national defense. Secondly, I would study the world of economics. I know of no other area that influences more directly and continuously the opportunity we have to strengthen our nation. What I am saying is to take enough of the fundamental and intermediate level courses to understand the orchestration of budgets and why there are the Congressional Budget Office, and the Office of Management and Budget.

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TACTICAL AIRCRAFT OPERATIONS FROM SOIL AIRFIELDS — In an important test by AFESC, Tyndall AFB, Fla., and the Flight Dynamics Laboratory, Wright-Patterson AFB, various F-4 aircraft ground maneuvers were conducted on soft soil surfaces. Data gathered from the tests is being used to validate and improve several computer routines which predict an aircraft's ability to take-off, land, and taxi on a soil surface of known characteristics. Insight gained from this study will be used for contingency airfield construction and in the design of future aircraft landing gear assemblies. (AFESC/RDCR, Capt. Wallington, AUTOVON 970-6307).

SMOKE ABATEMENT SYSTEM FOR CRASH RESCUE/FIRE TRAINING FACILITIES TECHNICAL REPORT, ESL-TR-81-43 provides the design for a smoke-abated aircraft crash fire suppression training pit. The design is for a 75-foot diameter fire area suitable for operations in freezing and non-freezing climates. With this system, liquid petroleum fuels (Class B) can be burned with a 95 percent reduction in visible smoke by injecting a fine water spray just over 2-inches above the surface of the burning fuel. This report includes all design drawing necessary for the construction of a smoke abatement pit and provides detailed step-by-step operating procedures. To get the report, write: Defense Technical Information School, Cameron Station, Alexandria, Va. 22314. (AFESC/RDCS, Capt. Kwan, AUTOVON 970-6282).

P-13 DUAL AGENT APPLICATION TECHNICAL REPORT, ESL-TR-81-44, details the development of a dual fire suppression agent dispensing system for the AS-32/P-13 airfield ramp fire fighting vehicle. The system can dispense both dry chemical agent (PKP) and liquid vaporizing agent (Halon 1211) either singularly or simultaneously from one combination nozzle. This dispensing system satisfies the flight and taxiing load requirements of MIL-A-8421 and can be operated efficiently by one fire fighter. Fire Protection officials at AFESC, Tyndall AFB, Fla., say that all future buys will automatically include this feature. (AFESC/RDCS, Capt Kwan, AUTOVON 970-6282)

CRUSHED STONE/FIBERGLASS FOD COVERS — Fiberglass reinforced plastic membranes have been developed to replace AM-2 as a cover for repairs on bomb damaged runways. They will require less manpower, less time to install and provide essentially flush repairs. Improved fiberglass mats and procedures for using them are being developed. (AFESC/RDDC, Capt. Beyer, AUTOVON 970-6322)

RAPID RUNWAY REPAIR FOR CARGO AIRCRAFT VS AM-2 REPAIRS— Crushed stone repairs with fiberglass covers are recommended (in lieu of AM-2 patches) for C-5 and C-141 takeoff and landing operations. If fiberglass covers are not available, crushed stone without a cover should be used, but the repairs should be swept periodically to remove loose stone. AM-2 mat repairs should be the last choice, as C-5 or C-141 operations over AM-2 mat can be extremely hazardous, particularly with aircraft braking. (AFESC/RDCR, Capt. Ruschmann, AUTOVON 970-6329)

FOOD SERVICE WIRE WHIPS FOR MIXING MACHINES sometimes become misaligned or broken. A whip with broken or missing wires will not do the proper job and could cause damage to your mixing machine. However, before you discard your old whip and buy a new one, we suggest you look into having it repaired. Time and money could be saved! Check your yellow pages under spring or wire fabricators. (AFESC/DEH, Mr. Merwin, AUTOVON 970-6169)

SMALL COMPUTER SOFTWARE EXCHANGE—The Air Force Data Systems Design Center (AFDSDC/DMT) is providing a new service for users of small computers (Apple II, TRS 80, etc.). Called DIAL-A-LOG, it is a free on-line system tied to the Advanced Research Project Agency Network (ARPANET) which assists in the sharing of software developed by different MAJCOMs and independent users. It provides a software library and a bulletin board for messages. To gain access to the system, you must have a terminal and a modem and must follow the instructions below.

a. Obtain local access to the ARPANET. If your base does not have an ARPANET gateway, call AUTOVON 921-3171 to access the AFDSDC gateway to the ARPANET.

b. Type @ (RETURN).

c. Type @ 1/13 (RETURN).

d. At prompt '@' type DIAL-A-LOG ABC (RETURN). The DIAL-A-LOG menu will lead you through the system. (AFESC/DEMG, Maj. Golondzinier, AUTOVON 970-6390)

Unaccompanied Personnel Housing

A BRIGHTER OUTLOOK

by Capt. Hedy Pinkerton

Despite record overall budgetary cuts by Congress this year, the FY 83 unaccompanied personnel housing program promises to be a banner year for the Air Force.

In a statement to the military construction subcommittee of the House Armed Services committee, Maj. Gen. Clifton D. Wright, Air Force Director of Engineering and Services, stated, "Roughly double the size of last year's request, our $130 million program is designed to improve privacy, safety, and aesthetics while maintaining standards consistent with Department of Defense policy."

Thirty-four locations are included in the FY 83 program. Approximately 9,400 enlisted housing spaces are planned for either improvement or construction, and a parallel officer program includes about 500 spaces.

Continuing emphasis is seen for the future years with the Air Force goal being a first time completion of the entire inventory by FY 89. An average expenditure of $250 million per year is currently programmed through FY 89 to attend to existing deficiencies and upgrade substandard quarters to new construction standards. When comparing this to the $50 million average budget the Air Force has been working within for the past five years, it is evident that the program is proving to be a highly visible one which is receiving strong support in the budgetary arena by all echelons of Air Force leadership.

Improving military living standards, however, is not something new for the Air Force. Stress has been placed on improving the quality of unaccompanied housing since the early 50's. While the other Services were building predominately open bay housing or rooms configured for eight persons, the Air Force was building three-person rooms. Beginning with the FY 71 program, the Air Force asked for and was granted authorization by the Secretary of Defense to construct two-person rooms. Although this did not provide more living space per occupant than the other Armed Services, it did push the Air Force closer to its goal of providing the individual service member more privacy in day-to-day living conditions.

Increased privacy has been a key feature of the Air Force unaccompanied housing program ever since the inception of the all-volunteer force system. Although not amenable to quantification, studies have consistently shown that retention is affected by the way an individual perceives the manner in which he/she lives in relation to chronological or economic contemporaries. Air Force surveys have revealed that better than 87 percent of all recruits lived two or less to a room prior to enlistment. Thus, the Air Force continues to nurture its aim of providing the best living conditions possible for its people within the allocated square foot area and cost limitations imposed by the office of the Secretary of Defense and Congress.

Efforts on the part of the Air Force to improve unaccompanied personnel housing remain in the forefront. Currently emphasis is being placed on two key issues: a proposed legislative change which would increase the amount of space authorized for individuals living in unaccompanied personnel housing and inclusion of transient quarters upgrade into the unaccompanied housing program. Although each of these are monumental tasks, attainment will enable us to strive for even higher standards for unaccompanied housing residents.

With rising military personnel costs under the gun from the Congress and the public, The Air Force faces a tough job in demonstrating why the standards it seeks should be funded in a time of such budget austerity. Nonetheless, the Air Force has established its goals and intends to pursue them. Until we can reach those standards, we do not believe we have provided adequately for all our unaccompanied personnel. E&S

Capt. Hedy Pinkerton is the Unaccompanied Personnel Housing Program manager, Housing and Services Division, Directorate of Engineering and Services. Her last assignment was Plattsburg, N.Y., where she served as both a food services officer and eventually the wing's executive officer. Captain Pinkerton's bachelor's degree is in home economics from Northwestern State University, La. She is also presently working towards a master's degree in marriage, family and child counseling.

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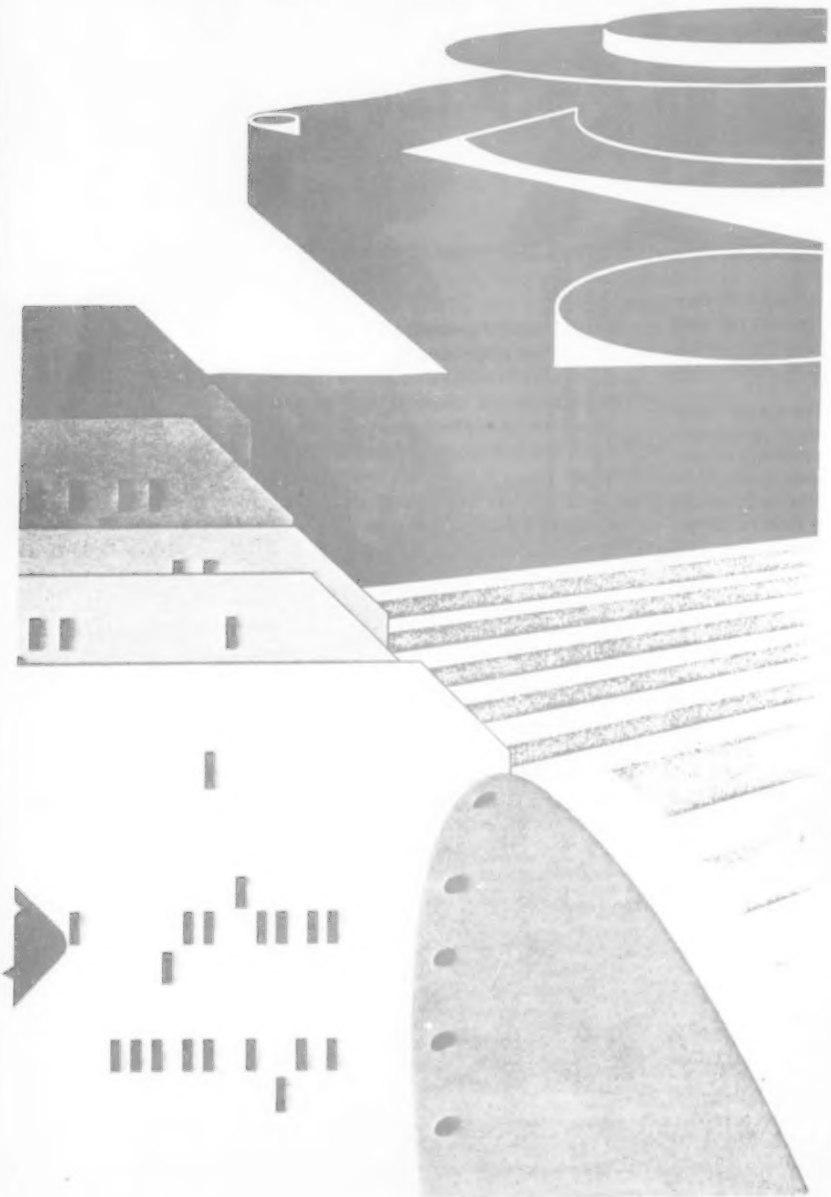
Vending machines in the dining halls? No,

AUTOMATED FOOD SERVICE



by Capt. Walter T. Kelly

A variety of misconceived notions may come to mind when we hear the words "automated food service." Many commanders may grasp their chest saying, "Oh no! They are going to shut down the dining hall and put in a bank of vending machines!" Calm down. When we speak of automation in food service, we are referring to a computer based management information system designed to improve control, accountability and management efficiency within a food service operation. The proposed new system is called the Automated Food Service Operations System (AFSOS).

The Air Force recognized the need to improve the efficiency of operations in food service in the early 1970s. The US Army Natick Laboratories, which is responsible for all DOD food service research and development, (see "A Mission of Food," ***Quarterly,*** Winter 1981-1982), was asked to develop an automated food service accounting and reporting system. In conducting research on such a system, Natick found there had been numerous advances in computer supported food service systems in the civilian sector. Various systems were able to perform forecasting of customer counts, development of acceptability factors for various menu choices, inventory control, recipe adjustment, labor control, productivity reporting and on and on.

Natick Laboratories carefully reviewed the various system features available to determine which would be suitable in an Air Force dining hall environment. They found that the numerous food control and accountability features of the industry systems have application in Air Force food service. These features would aid in improving inventory and produc-

tion control and provide the tools necessary to reduce waste. As a result there would be a positive impact on the management of the millions of dollars the Air Force spends on food each year.

In addition to the food control aspects of the system, the Air Force asked Natick Laboratories to include a module, or a program to provide access control—that is to positively identify whether or not a customer is entitled to a meal at government expense. This particular feature was added as a result of a study conducted for the Air Force by Cornell University. Cornell recommended a system supported by a microcomputer using magnetic strip meal cards and card readers. The Air Force accepted their recommendation for inclusion in the system Natick was developing. This added program became more attractive when it was learned that DOD had an initiative under way to replace the current ID card with magnetic strip ID cards. The introduction of a magnetic strip ID card will permit the elimination of the present meal card (DD Form 714) at bases with the AFSOS. (A schematic of the overall proposed prototype system is in Figure 1.)

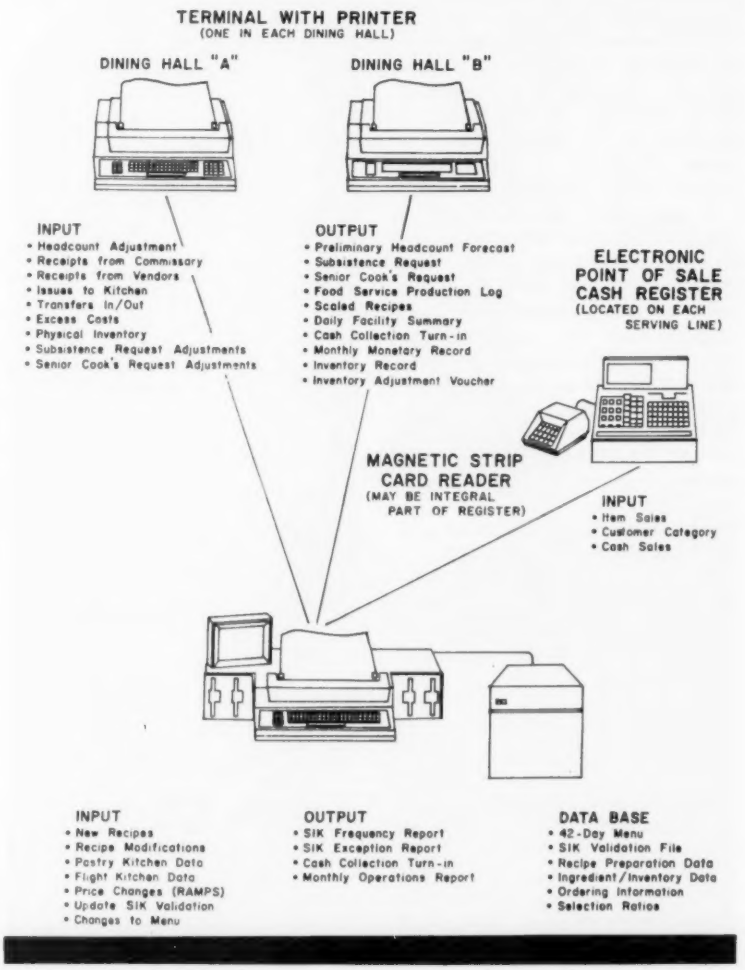
Air Force managers at all levels, responsible for food service, are aware of the need to control unnecessary waste and fraud as well as improve the efficiencies of our food service operations. Continuing emphasis to better account for subsistence and control waste has been generated by the Air Force Food Management Teams and inspection and staff assistance teams from the major commands. Additional emphasis came at the completion of the Defense Audit Service audit of the DOD food service program in 1980. The auditors estimated the potential for losses could exceed $100 million annually throughout DOD due to fraudulently generated headcount alone. The source of this fraud is either from customers who are not authorized eating without charge or from supervisors who pad the headcount.

The obvious question now is, "Will a computer based food management system stop all fraud, theft and waste in food service?" In a word, the answer is, "No." But, the system will help identify quickly and more accurately when and where there is a problem. And, because the supervisor is freed from many of the daily time consuming administrative activities, he or she will be better able to supervise the handling of inventory; observe production practices in the kitchen and serving techniques; control employees who attempt to eat free meals or take food home; and be more available to patrons.

In Figure 2 there is a list of changes that will occur through the introduction of an automated management information system in food service and the benefits that will result. As you can see, the supervisor will become more of a manager and less of a paper shuffler. This is because most of the food service forms and documents can be computer generated under AFSOS with required information already printed on the forms.

Introduction of a computer based food service system will not necessarily reduce the amount of paper or information a typical supervisor has to deal with, but it will reduce the many tedious hours each day a supervisor uses to complete paperwork. Additionally, this system can be programmed to generate management reports that provide the manager with information for making daily decisions or identifying a potential or real problem in the food service

AUTOMATED FOOD SERVICE OPERATIONS SYSTEM



operation.

Your concerns now probably turn to whether or not the typical food service worker or cook can handle an automated food service system. This has been an item that Natick Laboratories has been very sensitive to in developing programs for the AFSOS. First of all, very few of the food service people will have a direct interface with a computer terminal. The people affected by the proposed new system would be the food service officer/superintendent, dining hall supervisors, food service accountants and the storeroom clerks. It is unlikely that any of these individuals would find the automated food service system difficult to work with since all of the interface with the computer will be through self-prompting techniques. In other words, in almost all cases when an individual is entering information at a terminal, the information would be entered in response to a specific question displayed to the operator. In most cases the responses to the questions will involve a "yes" or "no" answer or the entry of a number or series of numbers. A sample of a screen display on a specific transaction in in Figure 3.

In food service we are all familiar with Murphy's Law which states, "If anything can go wrong, it will." Food service people are sensitive to the needs of our customers and fully recognize their role in supporting the base mission on a day-to-day basis. In the event there is a breakdown at any point in the system, food service would revert to a manual system. Certain data would absolutely have to be maintained and entered into the computer when the system was reactivated. This is particularly true of data that is necessary for maintaining an audit trail. There will be certain procedures that managers would go through in order to make this reversion to the old manual system as painless as possible. For example, the computer can generate the Air Force Form 148, Senior Cook's Requisition, for any future days based on stored data. Therefore, the supervisor can run off a single page copy of the Senior Cook's Requisition for the entire month on the first day of the month. This way if there is a system breakdown, the dining hall will have a printed copy of the AF Form 148 that lists the specific items needed for each meal for each day. The supervisor would only need to make adjustments in the issue quantities if there was a change in the feeding circumstances that may impact either on the menu or the amount of food necessary to prepare.

```
ALL PEOPLE SIGNING ON THIS MACHINE MUST ENTER A VALID
SOCIAL SECURITY NUMBER.
ENTER YOUR SOCIAL SECURITY NUMBER: 987654321
YOUR SOCIAL SECURITY NUMBER HAS BEEN ACCEPTED.
ENTER YOUR PASSWORD: AIRFORCE
WOULD YOU LIKE TO CHANGE YOUR PASSWORD? (N/Y)N
        STATUS ON WALTER KELLY
THIS IS THE FIRST TIME YOU USED THE COMPUTER THIS
MONTH.
THIS IS THE FIRST TIME YOU USED THE COMPUTER THIS
YEAR.
HIT RETURN TO CONTINUE.
        * SYSTEM MENU *
AVAILABLE MODULES:
     1) ACCOUNTING
     2) FILE MAINTENANCE
     3) FORECASTING
     4) MENU PRODUCTION
     5) ACCESS CONTROL
     6) INVENTORY
     7) REPORT PREPARATION
     8) END SESSION
WHICH MODULE? 3
        * FORECASTING *
AVAILABLE FORECASTS:
     1) HEADCOUNT
     2) SELECTION RATIO
     3) EXIT
WHICH FORECAST? 1
        * HEADCOUNT FORECASTING *
INPUT DATE OF REPORT (MMDD): 0101
        * HEADCOUNT FORECASTING *
INPUT DATE OF REPORT (MMDD): 0101
WHICH DINING HALL (1-2)? 1
        * HEADCOUNT FORECASTING *
INPUT DATE OF REPORT (MMDD): 0101
WHICH DINING HALL (1-2)? 1
     USER MESSAGE: FORECAST FOR 1/1
     HAS BEEN MADE PRIOR TO THIS RUN
     ENTER 'R' TO REPROCESS THIS RUN
     'P' TO PRINT FORECAST ALREADY ON FILE: R
ANY ADJUSTMENTS TO BE MADE FOR 01/01? Y
ANY ADJUSTMENTS TO BE MADE FOR 01/01? Y
WHICH MEAL? (1-2-3-4): 2
AMOUNT OF ADJUSTMENT? 75
MORE? N
```

FIGURE 3

The U.S. Army Natick Laboratories is moving forward at a steady pace making preparations to test the prototype system. The test will be conducted over a six-month period at Seymour Johnson, AFB, N.C. If the test is considered a success and the system developed by Natick proves to be the most cost-effective approach to preventing fraud and waste in food service and improving an otherwise inefficient paper work intensive operation, then the system will be implemented Air Force-wide beginning in late FY84 through FY86.

Implementation of the system is proposed at base food service operations under the a la carte system (ALACS) that serve greater than an average of a hundred weighted rations

CHANGES FROM PRESENT				
Access Control	**Forecasting**	**Inventory Control**	**Menu Production**	**Accounting and Reporting**
Eliminate DD Form 714, Meal Card.	Predictions of headcount are generated by the computer.	Opening inventory will be maintained in the computer.	Food service production log is generated by the computer.	Daily accounting maintained and updated by the computer.
Introduce magnetic strip ID card in place of the present DD From 714.	Prediction of the quantity of the meat entrees to prepare are computer generated.	Computer compares physical inventory to book inventory at the end of the month.	Recipes are printed listing the amounts of ingredients required to prepare the exact number of servings needed.	End of month operating report generated by the computer.
SIK customers have cards read electronically instead of cashier entering a meal card number.		Computer generates subsistence requests for the commissary.	The manager receives a report after the meal highlighting the number of servings to prepare versus the number of servings sold.	Management reports printed by the ECRs will be printed by the computer in more useable format than the ECR tapes.
PROJECTED BENEFITS				
Cashier can identify on the spot whether a customer is entitled to a meal at government expense.	Eliminates unscientific guesswork of the supervisor on how many people to feed.	Storeroom clerk does not have to maintain stock record cards.	Supervisors freed from handwriting or typing all the details of each meals production requirements.	Improved accuracy and performance of routine mathematical calculations.
Customer will not be able to eat in two different facilities during the same meal period.	Provides more accurate estimates on how much to prepare to reduce over production and runouts.	No one will be able to manipulate inventory records without the manager being aware.	Shift leaders and cooks do not have to convert recipes to the number of servings to prepare.	Supervisors freed from manually computing daily current income and making other manual entries to the Monthly Monetary Record (AF Form 1119).
Member will be reluctant to share his or her ID card with a friend if his/her picture is on the front of it.	Forecast is basis for generating the amount of food to request, therefore, preventing unnecessary high inventory levels.	Storeroom clerk will not have to spend tedious hours each week determining subsistence requirements and typing or writing out these requirements.	The supervisor is provided detailed information after the meal on which to base future decisions or identify a possible problem.	Manager does not have to sort through endless rolls of cash register tapes for post-meal data collection and analysis.
Reported lost or stolen ID cards are identified on the spot.				
Supervisor cannot artificially increase headcount without a SIK member's magnetic strip ID card or the signature and SSN of a non-permanent party SIK customer.				

FIGURE 2

daily, equating to about 128 Air Force installations world-wide. As we draw closer to the time of implementation another major consideration is the availability of maintenance support of a microcomputer system. This too, will impact on the decision to implement an automated food service system.

From this day forward, when you hear talk of automation in food service, don't think of a bank of vending machines or of a system being imposed upon your limited time. Picture a smooth running, efficient information system that will bring management of our food service facilities into the 1980s.

E&S

Capt. Walter T. Kelly is the chief of services, Bitburg Air Base Germany. Previously, he was assigned to the Housing and Services directorate, Headquarters Air Force Engineering and Services Center, Tyndall AFB, Fla., as the project officer for the Automated Food Service Operations System. He has a bachelor's degree from Clemson University and master's degree in management and supervision. He is a graduate of the AFIT Education with Industry with ARA Services, Inc.

HEADCOUNT FORECAST					
PROJECTIONS FOR JULIAN DAY: 1 CALENDAR DAY 1/1					
HALL	BREAKFAST	LUNCH	DINNER	MIDNIGHT	DAILY HALL TOTALS
1	INITIAL: 274	780	730	134	1918
	ADJUST: 0	75	0	0	75
	FINAL: 274	855	730	134	0
COMMENTS: **Projection** based on computer forecasting.					

The Air Force, the Community and the Environment: THE ROLE OF PUBLIC AFFAIRS

By Lt. Col. John G. Terino

When the Air Force is involved in environmental actions, public affairs is not a luxury. It's a necessity. America's open society encourages citizen participation in government. The news media report things as they happen - not when they are over. Therefore, consideration at the start - not as an after thought - of the public affairs aspects of anything involving the public and the environment is essential.

The Council on Environmental Quality (CEQ), implementing the National Environmental Policy Act (NEPA), requires public notification and participation, and the best interests of DOD and the Air Force call for open and full disclosure of our activities.

Even if these requirements did not exist, there are still two basic reasons for making public affairs a prime consideration in any beddown, transfer, closure, construction, property acquisition, toxic materials handing, or similar action. First, it's good community and human relations. Second, it helps us do the job better.

At this point, a note of caution. Neither the inclusion of a public affairs officer (PA) as a part of the Air Force team analyzing the environmental impact of the proposed action, nor the subsequent development and use of a comprehensive public affairs plan should be viewed as a cure all. Public affairs cannot thwart controversy, eliminate advocacy by special interest groups, prevent unfavorable (depending on your viewpoint) news coverage, or leave all involved happy. There are limits to what even the best conceived and executed public affairs program can accomplish.

The Scope of Public Affairs

What can and can't be done by public affairs? Why is it so important?

Throughout the environmental process, whether it proceeds to the filing of an impact statement or not, the public affairs officer can be a great help.

Working with the commander, the environmental protection planner, and the other key persons involved, the public affairs officer provides knowledge of community sensitivies, projects, special interest groups and key leaders. This is particularly important when planning how the proposed action will be presented and how the impact study will be developed.

The analysis must adequately address environmental impacts and must be sensitive to the community and the Air Force family — military, civilian employees, spouses, children — who will be affected by the proposed action. In addition to being a community and media relations advisor, the public affairs officer's role is to consider the tasks and actions of all the others involved in the analysis process, then develop the public affairs plan. That plan, when followed, aids those doing the analysis and keeps both the community and the Air Force family informed.

To effectively assist the commander, the public affairs officer, whether at base or higher level, must be involved from the beginning—giving advice on how and when to announce the proposed action, helping determine who to include in the initial scoping meetings, providing up-dates on how the analysis is proceeding, serving as a focal point for news queries, and aiding in responding to government and community groups.

Even when the analysis of environmental impacts results in the determination that the proposed action is not significant enough to warrant preparing a draft environmental impact statement, the public affairs officer must be involved and informed. The public affairs officer must know the facts to properly consider whether to make a news release explaining the decision or to hold it for response to query.

Bringing the public affairs officer into the environmental impact analysis process at the outset is an effective means of dispelling rumors, presenting facts, and promoting understanding.

Under NEPA and CEQ regulations, the environmental impact analysis process seeks inputs from those with legitimate interest in and those who are going to be affected by the proposed action. The analysis is designed to provide the decision maker with all points of view for consideration in making the final decision. A public affairs program for any proposed action should not be a ***selling*** program.

To take an advocacy position would also contradict the stated purpose of the process, normally expressed as "a detailed study to analyze the effects and determine the advisability of....." However, this does not mean the installation or activity involved must remain mute. If there is an action of sufficient scope or controversy to trigger the need for an environmental impact statement, it follows that there will be a very real need to explain the proposal and the analysis process in many groups, including those who wear the uniform. The objective is to ensure the public understands the proposal and how the analysis process works.

While much apprehension and opposition may be eliminated once people know and understand what is really happening, it is highly unlikely that any public affairs program can eliminate controversy entirely.

Controversy usually becomes most visible in the news media. This is particularly so if the proposed action involves a reduction, a closure, or air, water, or noise impacts. Headlines opposed to the proposed action are likely.

As long as the facts are accurate, determining whether the story is favorable or not is a matter of viewpoint. What is important is the accuracy of the accounts and the degree of fairness in presenting viewpoints. That is where the public affairs officer and everyone else dealing with community, government, and news media representatives have a big job.

Good relations with the news media, as well as the public, built over the years by the base, coupled with a public affairs program that is open, candid, and responsive, can promote the most factual and accurate reporting possible under the circumstances. Public affairs officers can't control the media, but with the cooperation of the commander and his staff, they can be a trusted, accurate source of information who the media will listen to.

Developing the Public Affairs Plan

Ideally, the public affairs plan should be prepared prior to the announcement of the proposed action. This may not always be possible, especially if the action is part of a series of proposals announced by either DOD or HQ USAF. Although the public affairs plan may be developed at a higher level for major or sensitive proposals, for the sake of this discussion it will be assumed that the base will be the focal point for all public affairs activities. The public affairs plan may be part of the overall environmental impact analysis plann—an annex—or a separate plan. Should announcement of the proposed action and public affairs guidance be furnished from a higher level, appropriate adjustments can be made.

(If you are interested in getting copies of Colonel Terino's sample plan, news release and action chart, write him at: OASD/PA, Pentagon, Washington, D.C. 20301, Attn: Lt. Col. John Terino.)

Lt. Col. John G. Terino, chief, editorial services branch, American Forces Information Service, is responsible for the Department of Defense SSAM newspaper and Defense '82 magazine. He has a master of public administration degree with emphasis in environmental management from Golden Gate University; was the Air Force Engineering and Services Center's first director of public affairs; has had articles on environmental problems in the Air University Review, and has lectured on environmental public affairs at AFIT's Civil Engineering School for seven years.

CESMET tips

The Air Force Civil Engineering and Services Management Evaluation Team (CESMET) reviews, evaluates and assists base civil engineering and services functional areas in accomplishing their mission in the most effective and efficient manner. This department is designed to pass along new ways to do the job better.

We present certificates of outstanding achievement to base personnel who are doing absolutely "Top Notch" work. Here is a list of the latest recipients:

- **Minot AFB**- SrA. Laura Konsharek, Outstanding Holding Area
- **U.S. Air Force Academy**- George Hartt, Furnishing Mgt. Division
- **Tinker AFB**- Barton Longrie, best Prime BEEF program observed
- **Tinker AFB**- Dick Brannon, Fire Protection

CIVIL ENGINEERING

During this past year, 12 civil engineering workers were injured and six fatalities occurred as a result of electric shocks or burns. As a contrast, in 1980 no fatalities and only five injuries were reported. This sharp increase in injuries and fatalities demonstrates the need to reinforce safety precautions when working around energized electric equipment and circuits. Of the six 1981 fatalities, only one was an electrical worker. Electrical safety must be stressed in all shops. Each shop foreman must include electrical safety instruction in shop meetings. (W.E. Reeve, HQ AFESC/DEMM, AUTOVON 970-6346)

MATERIAL CONTROL

Recently we have seen several locally developed systems being used to control and monitor bills of material (BOM). The systems employ a card file to record the dates when:

- The BOM is received in Material Control
- The first item is requisitioned
- The last item is requisitioned
- The last item is received
- The BOM is verified
- The BOM folder is sent to Production Control, and
- The materials are drawn.

Also, recorded are the work order/job order number, required delivery date and priority.

This card system allows the Materiel Control Chief to measure how long it takes to complete BOMs by each segment. It also allows him to monitor trends and ask: "where are we going?" As a spinoff, the system simplities monthly reconciliations between the Holding Area and Production Control, and it provides a simple suspense/tracking system. Once the system is set up it becomes a very powerful management tool.

BUDGET

During a recent visit we were able to provide Resource Management System (RMS) training to a newly assigned funds manager. This brought to our attention the critical need to get our people trained, especially new funds managers.

How do you approach the requirement? Have a plan! The base referred to above had approached the situation positively. Various training objectives were formulated and foresight on the part of management had allowed for an overlap with the departing funds manager. This hands-on approach is probably the best training that can be obtained.

But what if that luxury is not available? Here are some other sources to consider:

- Assistance visit from the MAJCOM DEU folks
- Send your funds manager TDY to a nearby base for one-on-one training with an experienced counterpart; and,
- RMS training from the local budget office.

The latter will be most helpful and is readily available. The budget office is most interested in getting you "up to speed." They depend on you as a key resource advisor in the overall base resource management process. Additionally, don't forget the management applications course at Wright-Patterson AFB, Ohio. Develop your plan, accomplish the training, and become a competent financial manager.

Reflections

After nearly four decades of service to the United States Air Force, I have elected to retire. There are many reasons. First, there must be room at the top. We have outstanding people. Without the opportunity for greater responsibilities and advancement, without the room to grow, the entire process of developing leadership stagnates. No one person should keep the top position in Engineering and Services tied up too long. And when the Directorship is passed on, the sense of confidence we feel in the validity of our mission must continue. I have the added pleasure of knowing that I leave the organization and its people in good, capable hands.

In the four years since I assumed the Directorship, I have reached some conclusions which may be of value to you in your future careers. Let me share them with you.

- The first priority of Engineering and Services is to support the readiness and survivability of the United States Air Force, and make it possible to deliver the attack to the enemy. Engineering and Services people are a vital and integral part of the fighting capabilities of our Air Force and deserve full recognition for their unique contributions to our nation's military capabilities.

- Future leaders of the Air Force are dependent upon what you do today, and what your predecessors have done in the past. Insuring that tomorrow's leadership can effectively carry out their mission is a responsibility of Commanders, Engineering and Services officers, and the planning and programming community. Whether it be facilities or developing the unique capacities of your people, you must employ vision and creativity as you program for tomorrow. You must use our energy, dedication and resources to maintain the usefulness and capabilities of the present.

- Needs and expressions of want can be but idle fantasies unless you are willing to run the gauntlet of gaining approvals and money. Each of you is challenged to understand the priorities of the Nation, including those of the Department of Defense and the Air Force, and from a perspective of where the defensive capabilities of the Air Force must be when your plans and programs bear fruit.

- Facilities are integral to fighting capacities and must support the weapon systems that the Air Force employs. And, when weapon systems are conceived, planned, programmed and developed, the facilities needed to sustain their operations must be considered at the same time, and from the viewpoint of how best to insure victory in war.

- Facilities, planes, missiles, electronic and supporting equipments are only as good as they are operable and maintainable. You cannot expect sophisticated, leading-edge technology to work unless you are willing to work — to make sure that operations and maintenance procedures are simple, effective and efficient; that continued use and operations will not eat away resources; that systems will still be adaptable and useful tomorrow.

- The facilities and equipment which you entrust to your people must not only be reliable, but must inspire an appropriate respect. Your designs must inspire an investment of care and pride by your people, and assure continued value to the Air Force and the American public.

- Listening and observing are important. Much of what you might otherwise pay research money for can be heard and seen every day. You must be open to the voices of Engineering and Services. You all live in the same universe. You are faced with the same basic challenges, and you reach many of the same contemporary conclusions. Engineering and Services will be far better in the future if you have a picture in your mind's eye of where you're going. When you listen and observe, you must know what it should be like, and work to attain it.

- Your people must be accorded respect. Ours is a Nation conceived on a premise of individual worth and dignity. Our military consists of citizens in uniform. We come from the population that we defend, and we return there.

- The people with whom I have worked for nearly 40 years — officer, enlisted and civilian — are all very important to me. Many of us have known each other for a long time, and we have seen the mission, responsibilities and image of Air Force Engineering and Services grow and mature. In my heart, I will always be one of you. You are the best hope for translating the theories of scientists and the promises of politicians into the products and services that can truly meet the needs and expectations of our people, and insure that there is the reasonable hope that our Nation, through strength and dedication, can deter war, and by deterring war, we can live and prosper in peace.

God be with you.

William D. Gilbert
Major General, USAF (Retired)
Past Director, Engineering and Services

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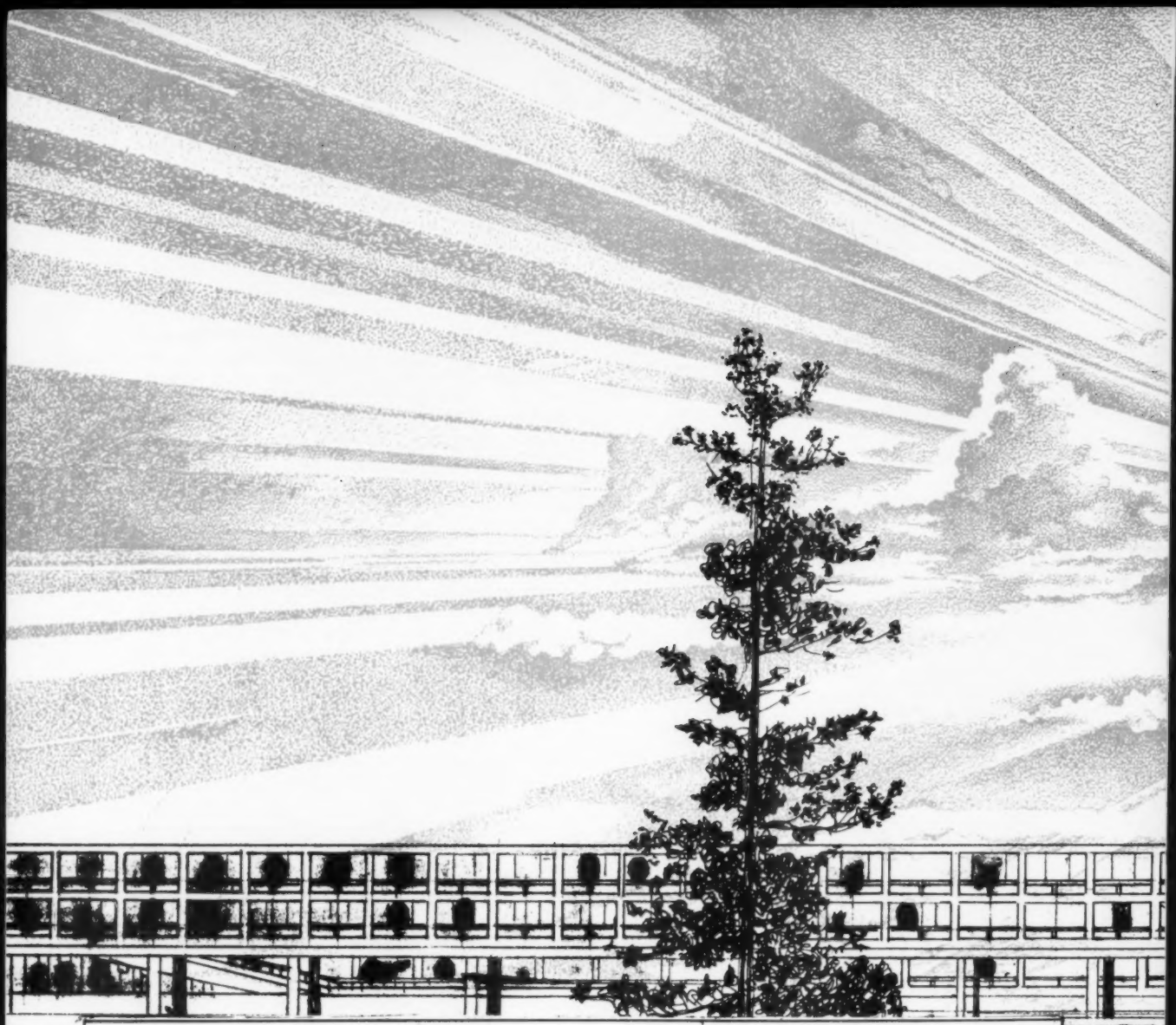

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